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UTAH STATE AGRICULTURAL COLLEGE BULLETIN

Catalog Issue

1950-51



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1950

LOGAN, UTAH

CONTENTS

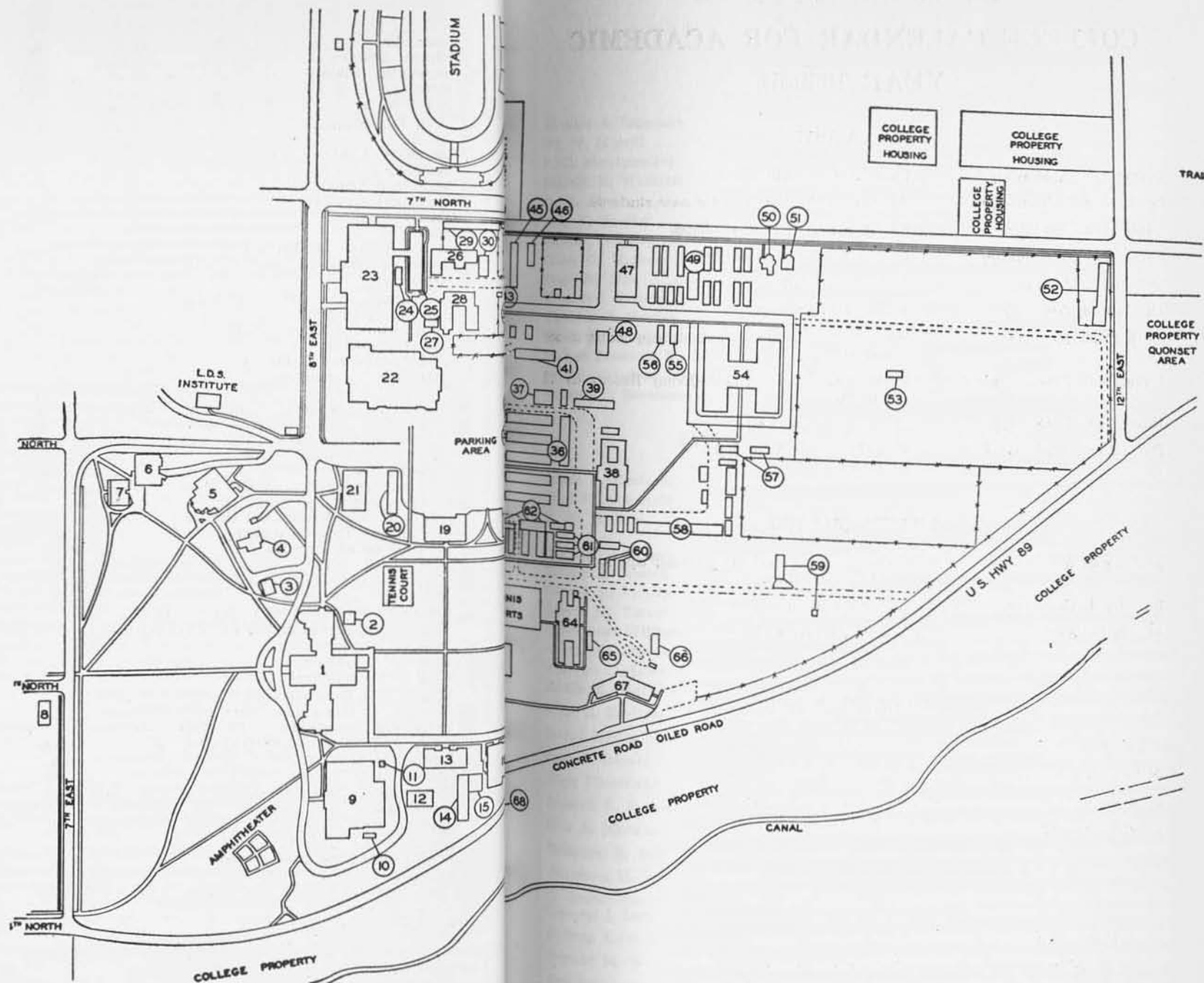
	Page
College Calendar, 1950-51	6
Administration—Board of Trustees, Officers of Administration	7
Faculty Committees	8
Emeritus Faculty	9
Faculty	10
Introduction	33
Student Organizations	40
Alumni Association	41
Academic Regulations	43
Admission	43
Registration and Credits	45
Lower division	47
Group Requirements	47
Upper Division	48
Graduation	49
Student Expenses	56
Scholarships, Fellowships, Awards	58
Graduate School	52
Requirements for High School Teaching Certificate	51
Special Student Services	63, 64
School of Agriculture	66
Agriculture	68
Agricultural Economics and Marketing	71
Agricultural Education	73
Agronomy	75
Animal Husbandry	80
Bacteriology and Public Health	83
Botany and Plant Pathology	86
Dairy Industry	88
Horticulture	91
Landscape Architecture and Planning	95
Poultry Husbandry	96
Vegetable Crops	97
Veterinary Science	99
Zoology, Entomology, Physiology and Nursing	100
School of Arts and Sciences	101
Bacteriology and Public Health	104
Botany and Plant Pathology	105
Chemistry	106
English, Journalism	110-114
Geology and Geography	115
History	117
Landscape Architecture and Planning	118
Dept. of Mathematics	118
Military Science and Tactics	120
Modern Languages and Latin	122
Physics	124
Speech and Drama	127
Zoology, Entomology, Physiology	131
Nursing	136
School of Commerce	139
Pre-legal training	140
Training for Government Service	140
Agricultural Economics and Marketing	141
Business Administration	143
Accounting	144
Business Administration	145
Business and Distributive Education	147
Merchandising	148

CONTENTS

	Page
Economics	148
Political Science	151
Secretarial Science	153
Sociology	156
Social Work	159
School of Education	162
Art	164
Education Administration	169
Elementary Education	170
Secondary Education	171
Vocational Education	173
Library Science	174
Music	175
Private Instruction Courses	177
Physical Education and Recreation	177
Psychology	184
School of Engineering and Technology	189
Engineering Division	191
Agricultural Engineering	191
Civil Engineering	194
Irrigation and Drainage	198
Division of Technology	200
Aeronautics	201
Aeronautical Ground and Flight School	203-204
Air Conditioning and Refrigeration	204
Automotive Technology	207
Industrial Education	210
Industrial Arts	211
Trade and Industrial Education	212
Photography	215
Metalwork and Mechanical Drawing	216
Machine Tool Technology	216
Mechanical Drawing	218
Forge Practice	219
Welding	220
Radio and Electronics	222
Woodwork and Building Construction	224
School of Forest, Range and Wildlife Management	227
Forest Management	230
Range Management	234
Wildlife Management	237
School of Home Economics	241
Curricula in Home Economics	243
Child Development and Parent Education	249
Clothing, Textiles and Related Arts	250
Foods and Nutrition	253
Household Administration	255
Home Economics Education	255
Military Science and Tactics	259-270
Research and Extension	271
Agricultural Experiment Station	272
Engineering Experiment Station	273
Extension Service	274
Extension Classes, Home Study, Visual Aids	274
Summer School	276
Evening School	276
Branch Agricultural College	278
List of Graduates 1949	279
Summary of Attendance	287
Index	288

LOCATION OF BUILDINGS

- 1 Main Bldg.
- 2 Art Barn
- 3 Extension Division
- 4 President's Home
- 5 Smart Gymnasium
- 6 Boiler House
- 7 Forestry Bldg.
- 8 Practice Cottage
- 9 Mechanic Arts
- 10 Chemical Storage Bldg.
- 11 S.C.S.
- 12 Research & S.C.S. Shop
- 13 Engineering Bldg.
- 14 Farm Mechanics Shop
- 15 Hydraulics Tank
- 16 Home Economics Bldg.
- 17 Library
- 18 Plant Industry Bldg.
- 19 Animal Industry Bldg.
- 20 Chemistry Classroom
- 21 Widtsoe Hall
- 22 Union Bldg.
- 23 Field House
- 24 Military Storage
- 25 Military Science Bldg.
- 26 Sheep Barn
- 27 Cow Shed
- 28 Cow Barn
- 29 Sheep Sheds
- 30 Sheep Shed
- 31 Horse Barn
- 32 Shed
- 33 Storage
- 34 Garages
- 35 Horticulture
- 36 Temporary Bldgs.
- 37 Boiler House (T-Bldg.)
- 38 Rural Arts
- 39 Chicken Coop
- 40 Chicken Coops
- 41 Chicken Coop
- 42 Poultry Bldg.
- 43 Veterinary Science Bldg.
- 44 Veterinary Science Lab.
- 45 Veterinary Science Lab.
- 46 Veterinary Science Lab.
- 47 Maintenance Bldg.
- 48 Stock Judging Pavilion
- 49 Equipment Storage
- 50 Co-op Bldg.
- 51 Nursery
- 52 U.S.F.S. Equipment Shed
- 53 Radio Lab.
- 54 Technology Bldg.
- 55 Book Bindery
- 56 Equipment Storage
- 57 Automotive Storage
- 58 Storage (Exper. Sta.)
- 59 Nursery (Forestry)
- 60 Storage (Forestry & Ext.)
- 61 Storage
- 62 Greenhouse
- 63 Storage (Greenhouse)
- 64 Tub
- 65 Storage (Tub)
- 66 Storage (Lund Hall)
- 67 Lund Hall
- 68 Concrete Water Tank



COLLEGE CALENDAR FOR ACADEMIC YEAR 1950-51

FALL QUARTER

September 25, Monday.....	First faculty meeting.
September 28, Thursday.....	Aptitude and other tests for new students.
September 29, Friday.....	Registration of former students.
September 30, Saturday.....	Registration of new students.
October 2, Monday.....	Instruction begins.
October 14, Saturday.....	Homecoming.
October 30, Monday.....	Prospective graduates submit applications for candidacy.
November 22, Wednesday.....	College closes for Thanksgiving Recess at 12 noon.
November 27, Monday.....	Classes are resumed.
December 20, Wednesday.....	Fall Quarter ends at 5 p.m.

WINTER QUARTER

January 3, Wednesday.....	Registration. Candidates submit applications for graduation.
January 4, Thursday.....	Instruction begins.
March 14, Wednesday.....	Winter Quarter ends.

SPRING QUARTER

March 19, Monday.....	Registration.
March 20, Tuesday.....	Instruction begins.
June 3, Sunday.....	Baccalaureate Service.
June 4, Monday.....	58th Commencement.

SUMMER QUARTER 1951

June 11, Monday.....	First Session begins.
July 20, Friday.....	First Session ends.
July 25, Wednesday.....	Second Session begins.
August 24, Friday.....	Second Session ends.

ADMINISTRATION

Board of Trustees

Thorpe B. Isaacson	Salt Lake City
W. W. Merrill	Logan
L. C. Montgomery	Heber City
Merrill N. Warnick	Pleasant Grove
D. A. Skeen	Salt Lake City
Ella V. Reeder	Brigham City
Arthur Woolley	Ogden
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Fred M. Nye	Ogden
Herschel Bullen, Jr.	Logan
Charles R. Hunter	Cedar City
Carl W. Petersen	Kenilworth
Heber Bennion, Jr., Secretary of State (ex officio)	Salt Lake City
W. W. Gardner, President, Alumni Association (ex officio)	Salt Lake City
Russell E. Berntson, Secretary-Treasurer	Logan

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R. H. Walker	Director, Agricultural Experiment Station and Dean, School of Agriculture
H. Wayne Driggs	Director, Branch Agricultural College
Milton R. Merrill	Dean, School of Commerce
Ernest A. Jacobsen	Dean, School of Education
Lewis M. Turner	Dean, School of Forest, Range and Wildlife Management
J. Stewart Williams	Dean, Graduate School
Carlton Culmsee	Dean, School of Arts and Sciences
Ethelyn O. Greaves	Dean, School of Home Economics
Jerald E. Christiansen	Dean, School of Engineering and Technology
John C. Carlisle	Dean, Summer Quarter
Daryl Chase	Dean of Students
Ione B. Daniel	Dean of Women
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William H. Bell	Registrar
Thurston H. Baxter, Colonel	R.O.T.C. Coordinator
C. Lester Pocock	Chairman, Public Relations
General J. Larsen	Secretary to the President
Sylvan Erickson	Assistant Secretary and Treasurer
Harold M. Wadsworth	Superintendent of Buildings and Grounds

The Deans' Council consists of the President, all Deans, the Registrar, the Executive Secretary and Treasurer, and the Directors of the Agricultural Experiment Station and the Extension Service.

Faculty Committees

The President of the College is ex officio a member of each standing committee.

Assemblies—The President, Dean of Students, Professors Fogelberg, N. W. Christiansen, Myers, Student Representatives.

Athletic Council—Hendricks, Caine, H. B. Hunsaker, Board of Trustees Representative, Berntson, Blaser, J. E. Christiansen, Chase, Alumni Secretary, "A" Men's President, Student Body President.

Attendance and Scholarship—Professors Floyd, Brite, Giddings, Lyons, West,

Awards and Honors—Ricks, Geddes, Milligan, W. P. Thomas, Blanch, Kelker, B. Johnson, Kendall, Burke.

Credit and Admissions—H. C. Sharp, Boyle, Hayward, Jones, N. S. Cannon, Registrar.

Debating—Robinson, Vickers, Hayward, Murray, W. Anderson.

Graduate Council—J. Stewart Williams, Culmsee, E. O. Greaves, Carlisle, Professors Hendricks, Thorne, Roskelley, Stoddart.

Graduation—Symons, Mortimer, Kelker, L. E. Harris, Stone, Meyer, Porter.

High School Relations—Humphreys, Pocock, Jacobsen, Cawley, Noble, Vickers, Chase.

Housing—Pocock, Van Shaar, Dean of Women, Cotter.

Library—Academic Deans, Director of Libraries.

Lyceum, Lectures and Concerts—Chase, Fogelberg, N. W. Christiansen, Berntson.

Personnel and Guidance—Dean of Students, Dean of Women, Registrar, Professors Maeser, Stone, D. W. Thorne, Burns.

Pre-Medical, Pre-Dental and Pre-Veterinary Work—Hammond, Culmsee, Gunnell, Bahler, E. Linford and Binns.

Professional Relations and Faculty Welfare Committee—D. A. Broadbent, L. L. Madsen, Murray, D. W. Thorne, Chase, Floyd, Frischknecht, E. O. Greaves, Blanch, Carlisle, Carpenter, M. C. Cannon.

Publications Council—Culmsee, Vickers, Reynolds, J. Stewart, Roth, G. Harrison.

Registration—Academic Deans, Registrar, Chase, Hayward, H. B. Hunsaker.

Schedule—Ralph Richards, Kelker, Arrington.

Student Affairs—Dean of Students, Dean of Women, Berntson, Downs, Ludlow, Student Body President.

Teacher Placement—Jacobsen, Mortimer, Humpherys, Carlisle, Cawley.

Emeritus Faculty

Peterson, Elmer George, B.S., A.M., Ph.D., LL.D.	President Emeritus
Harris, Franklin Stewart, B.S., Ph.D., LL.D., D.Sc.	President Emeritus
Peterson, William, B.S., D.Sc.	Director Emeritus, Extension Service
Pedersen, N. Alvin, A.B., Ph.D.	Dean Emeritus, School of Arts and Sciences
Wanlass, W. L., A.B., A.M., Ph.D.	Dean Emeritus of School of Commerce
Greaves, Joseph E., B.S., M.S., Ph.D.	Professor Emeritus of Bacteriology and Biochemistry
Arnold, Frank Russell, A.B., M.A.	Professor Emeritus of Modern Languages
Newey, Aaron, B.S.	Professor Emeritus of Metal Work
Kyle, Charlotte, A.B., A.M.	Professor Emeritus of English
Jensen, George C., A.B., M.A.	Professor Emeritus of Modern Languages
Daines, Franklin D., A.B., M.A., Ph.D.	Professor Emeritus of Political Science
Peterson, Parley E., A.B., C.P.A.	Professor Emeritus of Accounting
Swenson, D. A., B.S.	Professor Emeritus of Woodwork and Building Construction
Moen, Johanna, B.S., LL.D.	Professor Emeritus of Textiles and Clothing
Dancy, Charlotte, E., R.N.	Professor Emeritus of Physiology
Peterson, Henry, A.B., M.A.	Professor Emeritus of Psychology
McClellan, Charles E., A.B., M.A.	Professor Emeritus of Education
Brown, Almeda P., B.S., M.A.	Professor Emeritus of Home Economics
Sorensen, Alma Nicholas, A.B., A.M.	Professor Emeritus of English
Stewart, R. H.	Professor Emeritus, County Agricultural Agent
Evans, R. J., B.S., Ph.D.	Professor Emeritus of Agronomy
Fletcher, Calvin, B.Pd.	Professor Emeritus of Art
Barrows, Effie S., B.S.	Professor Emeritus, Extension Home Furnishings Specialist
Agren, Ellen, B.S., M.A.	Professor Emeritus, Home Demonstration Agent
Alder, Byron, B.S.	Professor Emeritus of Poultry Husbandry
Bowen, Edith, B.S., M.S.	Professor Emeritus of Education
Gardner, Willard, B.S., M.S., Ph.D.	Professor Emeritus of Physics
Humpherys, L. R., B.S.	Professor Emeritus of Agricultural Education
Sorenson, C. J., B.S., M.S.	Professor Emeritus of Entomology
Jennings, D. S., B.S., Ph.D.	Professor Emeritus of Agronomy
Geddes, Joseph R., A.B., A.M., Ph.D.	Professor Emeritus of Sociology

Faculty

(Including College, Agricultural Experiment Station, Extension Service,
and Branch Agricultural College)

Madsen, Louis L., B.S., Ph.D.,
President

Abrams, Milton, B.S.,
Associate Librarian

Acord, Clair Reid, B.S.,
Assistant Professor, County Extension Agent,
Uintah County

Adkins, Gordon H., Sgt., CAC (DEML),
Instructor in Military Science and Tactics

Aiken, Marian Cushing, B.S., M.S.,
Instructor in Child Development

Alix, Francis, M/Sgt., DEML,
Instructor in Military Science and Tactics

Allen, Bert V.,
Instructor in Photography
Photographic Service

Andersen, E. Milton, B.S., M.S., Ph.D.,
Associate Professor of Vegetable Crops

Anderson, Wendell, B.S., M.S., LL.B.,
Assistant Professor of Political Science

***Andersen, Stanley P.**, B.S., M.A.,
Assistant Professor of English and Journalism

Anderson, Roice H., B.S., M.S., Ph.D.,
Associate Professor of Agricultural Economics and Marketing

Andreason, Jane J., B.S.,
Assistant Librarian

Arrington, L. J., B.A.,
Assistant Professor of Economics

Ashton, Clarence D., B.S.,
Associate Professor, Extension Horticulturist

Bacon, Mary R., B.S.,
Assistant Professor, Home Demonstration Agent, Wasatch County

Bagley, LaZone, B.S., M.S.,
Assistant Professor, County Extension Agent, Wayne County

Bahler, Thomas L., B.A., Ph.D.,
Assistant Professor of Zoology

Bailey, Reed W., B.S., M.S.,
Director, Intermountain Forest and Range Experiment Station
Non-resident Professor of Forestry

Baird, Glen, B.S.,
Assistant Professor, Extension Agronomist

Banks, Alfred B., Major FA,
Assistant Professor of Military Science and Tactics

- Barlow, Joel C., B.S.,**
Assistant Professor, Assistant County Extension Agent,
Utah County
- Barron, Howard H., B.S.,**
Instructor, Assistant County Extension Agent, Weber County
- Bateman, George Q., B.S.,**
Associate Professor of Dairy Husbandry
- Bates, George S., B.S., M.A.,**
Collaborator in Teacher Training
- Beckett, James E., 1st Lt., CAC,**
Assistant Professor of Military Science and Tactics
- Beckstrand, Gordon, B.S.,**
Instructor, Assistant County Agent, Weber County
- Beecher, Asa L.,**
Ticket Manager
- Beecher, Vern R., B.S.,**
Instructor in Automotive Mechanics
- Bell, Marvin T., B.S.,**
Assistant Professor in Physical Education
Assistant Coach
- Bell, T. Donald, B.S., M.S., Ph.D.,**
Animal Husbandry
- Bell, William H., B.S., M.S.,**
Registrar, Professor
- Bennett, James A., B.S., M.S.,**
Assistant Professor of Animal Husbandry
- Bennett, William H., B.S., M.S.,**
Associate Professor of Agronomy
- Bennion, Marjorie, B.S.,**
Instructor in Home Economics
- Berntson, Russell E.,**
Executive Secretary and Treasurer
- Biddulph, Clyde, M.S., M.Ph., Ph.D.,**
Professor of Physiology
- Biggs, Ernest O., B.S.,**
Assistant Professor, County Extension Agent, San Juan County
- Bingham, Golden H., B.S.,**
Associate Professor, Extension Irrigation Specialist
- Binns, Wayne, D.V.M.,**
Professor of Veterinary Science
- Bishop, A. Alvin, B.S., M.S.,**
Associate Professor of Irrigation and Drainage
- Bishop, Don, B.S.,**
Instructor in Elementary Training School
- Blanch, George T., B.S., M.S., Ph.D.,**
Professor of Agricultural Economics and Marketing
- Blaser, Glenn F., B.S.,**
Veterans' Coordinator

UTAH STATE AGRICULTURAL COLLEGE

- Boswell, S. R., B.S.,**
Professor, County Extension Agent, Utah County
- Bowen, Calvin M., A.B., M.S.,**
Associate Professor of Forestry
- Boyle, William S., B.A., Ph.D.,**
Associate Professor of Botany
- Brimmer, Marvin L., M/Sgt., DEML,**
Instructor in Military Science and Tactics
- Brite, J. Duncan, B.A., A.M., Ph.D.,**
Professor of History
- Broadbent, Dee A., B.S., M.S.,**
Professor of Agricultural Economics and Marketing
Assistant Director Agricultural Experiment Station
- *Broadbent, Marden, B.S.,**
Assistant Professor
Assistant Extension Animal Husbandman
- Brower, Stephen L., B.S.,**
Assistant Professor, County Extension Agent, Iron County
- Bruce, Avery C., Captain, USAF,**
Assistant Professor of Air Science and Tactics
- Buck, Rulon, B.S.,**
Instructor, Assistant County Agent, Salt Lake County
- Budge, Keith M., B.S.,**
Instructor in Bacteriology
- Budge, Pearl S., B.S.,**
Instructor in English
- Buehler, Max**
Assistant Librarian
- Bullen, Asa, B.S., LL.B.,**
Lecturer in Commercial Law
- Buntine, Hugh A., B.E.E.,**
Assistant Professor of Aeronautics
- Burgoyne, David A., B.S., M.S.,**
Assistant to the Director, Agricultural Experiment Station
- Burke, Caseel D., B.S., M.S.,**
Assistant Professor of Education
- Burningham, Melvin S., B.S.,**
Assistant Professor, County Extension Agent, Washington County
- Burns, Ann, R.N.,**
College Nurse
- Burtenshaw, G. Ray, B.S.,**
Assistant Professor, County Extension Agent, Juab County
- *Burton, Theodore M., A.B., M.A.,**
Associate Professor of Chemistry
- Bush, Richard A., B.S.,**
Instructor in Botany

- Caine, Ann M., B.S.,**
Assistant Librarian
- Caine, George B., B.S., M.A.,**
Professor of Dairy Industry
Extension Dairyman
- Call, Anson B., Jr., B.S., M.S.,**
Associate Professor, County Extension Agent, Box Elder County
- Cannon, Melvin C., B.S., M.S., Ph.D.,**
Associate Professor of Chemistry
- Cannon, Norman S., B.S., M.S.,**
Assistant Professor of Accounting and Business Administration
- Carlisle, John C., B.S., M.S., Ed.D.,**
Professor of Education
Dean, Summer Quarter
- Carlson, Oretta M., B.S.,**
Instructor in Home Economics
- *Carpenter, G. Alvin, B.S., M.S.,**
Associate Professor
Assistant Extension Director in Charge of County Services
- Carter, Don, B.S., M.S.W.,**
Assistant Professor of Sociology
Assistant Director, Division of Social Work
- Carter, Pearl J., B.S., M.S.,**
Assistant Librarian
- Cawley, Helen L., A.B., B.S., M.S.,**
Associate Professor of Home Economics Education
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Instructor in Physical Education
- Chase, Alice K., A.B.,**
Instructor in Elementary Training School
- Chase, Daryl, B.A., M.A., Ph.D.,**
Professor and Dean of Students
Director, Student Personnel
- Chaudron, David L., M/Sgt., Inf. (DEML),**
Instructor in Military Science and Tactics
Assistant Supply Sergeant
- Child, Rawson, B.S.,**
Instructor in Welding
- Christiansen, A. L., B.S., M.S.,**
Professor, County Extension Agent, Weber County
- Christiansen, Jerald E., B.S., M.S., C.E.,**
Professor of Civil Engineering
Dean, School of Engineering and Technology
Director, Engineering Experiment Station
- Christiansen, N. Woodruff, B.S., M.A., Ph.D.,**
Professor of Instrumental Music
- Christoffersen, Paul V., DVM,**
Assistant Professor of Veterinary Science

UTAH STATE AGRICULTURAL COLLEGE

- Christy, Harold W.**, Captain, USAF,
Assistant Professor of Air Science and Tactics
- Church, Edward H.**, Captain, CAC,
Assistant Professor of Military Science and Tactics
- Church, Irvan J.**, Captain, USAF,
Assistant Professor of Air Science and Tactics
- Clark, Clayton**, B. S., E.E.,
Associate Professor of Radio
- Clark, Hazel C.**, B.S.,
Instructor in Elementary Training School
- Coates, Ruth D.**, B.S.,
Assistant Professor, Home Demonstration Agent, Piute County
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Associate Professor of Botany
- Coffman, W. Elmo**, B.S., M.S., Ph.D.,
Professor of Geology
- Colbert, Elizabeth**, B.S.,
Instructor in Home Economics
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Professor of Radio and Physics
- Cook, C. Wayne**, B.S., M.S.,
Associate Professor of Range Management
- Cornaby, Floyd V.**, B.S., M.A.,
Professor of Art
- Coulam Joseph**, B.S.,
Professor of Woodwork and Building Construction.
Extension Agricultural Engineer
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Professor and Director, Statistical Laboratory
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Assistant Professor, County Extension Agent, Garfield County
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Professor of Journalism
Dean, School of Arts and Sciences
- Daines, Spencer H.**, B.S.,
Associate Professor of Agricultural Engineering
- Daines, Josephine**, B.S.,
Assistant Professor, Home Demonstration Agent, Morgan County
- Dance, Jean R.**, B.S.,
Instructor in Textiles and Clothing
- Daniel, Ione B.**, B.A.,
Dean of Women, Associate Professor
Supervisor, Women's Residence Halls
- Daniel, T. W.**, B.S., M.S., Ph.D.,
Professor of Forestry
- Davis, Freda**, B.S.,
Assistant Professor, Home Demonstration Agent, Uintah County

- Davis, Lawrence C., B.S.,**
Assistant Professor, County Extension Agent, Grand County
- Dean, Elva C., B.S., B.L.S.,**
Instructor and Associate Librarian
- Despain, Bert L.,**
Assistant Professor, County Extension Agent, Davis County
- DeHart, Noble, B.S., M.S.,**
Instructor, Assistant County Extension Agent, Utah County
- Dionne, Edward A., B.S.,**
Instructor in Engineering
- Doty, Ina, B.S., M.S.,**
Assistant Professor of Business Administration and Accounting
- Downs, Lois, B.S., M.S.,**
Instructor in Physical Education
- Draper, Carroll I., B.S., M.S., Ph.D.,**
Professor of Poultry Husbandry
- Driggs, H. Wayne, B.A., M.A., Ph.D.,**
Director, Branch Agricultural College
- Dutton, Elizabeth Anne, B.S., M.Ed.,**
Associate Professor of Physical Education
- Edgecombe, Samuel W., B.S.A., M.S., Ph.D.,**
Professor of Horticulture
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Assistant Professor in English
- Egbert, Robert,**
Assistant Professor of Psychology
- Elich, Joe, B.S., M.A.,**
Assistant Professor in Mathematics
- Ellington, Charles G., A.B., M.B.A.,**
Assistant Professor of Accounting and Business Administration
- Ellsworth, S. George, B.S., M.A.,**
Assistant Professor of History
- Embry, Bertis L., B.S., M.S.,**
Assistant Professor of Agricultural Engineering
- Erickson, Sylvan, B.S.,**
Assistant Secretary and Treasurer
- Esplin, Alma C., B.S., M.S.,**
Professor, Extension Animal Husbandman
- Esplin, Grant M., B.S.,**
Assistant Professor, County Extension Agent, Beaver County
- Everton, Joseph K., B.S.,**
Instructor in Mathematics
- Eyre, Dean, B.S.,**
Assistant Purchasing Agent
- Floyd J. Whitney, B.S., M.S.,**
Professor of Forestry

UTAH STATE AGRICULTURAL COLLEGE

- Fogelberg, Thelma**, B.S., M.A., Ph.D.,
Associate Professor of Modern Languages
- France, Edward Leroy**, B.S.,
Assistant Professor of Automotive Mechanics
- Frandsen, Arden**, B.S., M.S., Ph.D.,
Professor of Psychology
- Frederick, Harold H.**, B.S., M.S.,
Assistant Professor, County Extension Agent, Rich County
- Frederickson, Carmen D.**, B.S., M.S.,
Assistant Professor of Sociology
- Frischknecht, Carl**, B.S., M.S., Ph.D.,
Professor of Agriculture
Director of Extension Service
- Garden, Henry J.**, 1st Lt., QMC,
Assistant Professor of Military Science and Tactics
- Gardner, Eldon J.**, B.S., M.S., Ph.D.,
Professor of Zoology
- Gardner, Rhea H.**, B.S., M.S.,
Associate Professor,
Extension Housing and Home Management Specialist
- Gardner, V. D.**, B.S., M.B.A.,
Professor of Accounting and Business
- Gerber, Robert K.**, B.S., M.S.,
Assistant Professor of Horticulture
- Giddings, Ralph L. Jr.**, Captain FA,
Assistant Professor of Military Science and Tactics
- Gilmore, Florence R.**, B.S., M.S.,
Assistant Professor of Textiles and Clothing
- Gordon, Vaughn**, B.S., M.S.,
Instructor in Physical Education
- Greaves, Ethelyn O.**, B.S., M.S., Ph.D.,
Professor of Foods and Dietetics
- Greenwood, Delbert A.**, B.S., M.S., Ph.D.,
- Gunnell, Merrill H.**, B.S., M.S.,
Assistant Professor of Zoology
- Guymon, E. Lee**, B.S., M.S.,
Associate Professor, County Extension Agent, Summit County
- Hailes, Charles W.**, B.S.,
Instructor in Industrial Education
- Hammond, Datus M.**, B.S., M.A., Ph.D.,
Professor of Zoology
- Hansen, Bessie**, B.S.,
Assistant Professor, Home Demonstration Agent, Box Elder County
- Hansen, Burrell F.**, B.S., M.A.,
Assistant Professor of Speech
- Hansen, Harold L.**, B.S., M.A., Ph.D.,
Associate Professor of Speech

- Hansen, Reuben, B.S.,**
Assistant Professor, Assistant County Extension Agent, Cache
County
- Hansen, Vaughn E., B.S., M.S., Ph.D.,**
Assistant Professor of Irrigation and Drainage
- Hardman, Stuart, B.S.,**
Instructor in Speech
- Hardy, Clyde T., B.S.,**
Assistant Professor in Geology
- Harris, Joseph R., B.S.,**
Chemistry
- Harris, Lorin E., B.S., M.S., Ph.D.,**
Associate Professor of Animal Husbandry
- Harrison, Gladys L., A.B.,**
Editor, Agricultural Experiment Station
- Hart, Philip J., B.S., Ph.D.,**
Associate Professor of Physics
- Hassell, Robert L., B.S.,**
Assistant Professor, County Extension Agent, Carbon County
- Hatch, LaPearl S.,**
Assistant Librarian
- Hayward, Ira N., B.S., Ph.M.,**
Associate Professor of English
- Heaton, Israel C., B.S., M.S.,**
Associate Professor of Physical Education
Extension Recreation Specialist
- *Heed, Willard M., A.B.,**
Instructor in English
- Hendricks, Charles D., M/Sgt. DEML,**
Instructor in Military Science and Tactics
- Hendricks, King, B.S., M.A., Ph.D.,**
Professor of English
Director of Libraries
- *Henderson, George R., B.S., M.S.,**
Professor, Extension Animal Husbandman
- *Hess, Alvin, B.S., M.S.,**
Collaborator in Teacher Training
- *Herring, Jack W., B.S.,**
Poultry
- Hill, Reuben L., B.S., Ph.D.,**
Professor of Chemistry
- Hirsch, Frederick H., AGD (DEML),**
Instructor in Military Science and Tactics
Artillery Administrative NCO
- Holland, John L., M/Sgt., DEML,**
Instructor in Military Science and Tactics

- Holmgren, Arthur H.**, B.S., M.S.,
Assistant Professor of Botany
Curator, Intermountain Herbarium
- Howard, Jack E.**, SFC, AGD, DEML,
Instructor in Military Science and Tactics
- Huber, Thelma**, B.S., M.S.,
Associate Professor,
Supervisor, Extension Home Economics Programs
- Hugie, Vern K.**, B.S., M.S.,
Associate Professor of Agronomy
- Hughes, Joseph C.**, T/Sgt., USAF,
Instructor in Military Science and Tactics
- Humphrey, Ellen S.**, B.S.,
Instructor in Elementary Training School
- Hunsaker, H. B.**, B.S., M.S.,
Professor of Physical Education
- Hunsaker, Lloyd R.**, B.S., M.S.,
Associate Professor of Dairy Industry
- Hunsaker, Neville C.**, B.A., M.A., Ph.D.,
Associate Professor of Mathematics
- Hurst, Clyde**,
Instructor of Diesel Mechanics
- Hurst, Rex**, B.S.,
Instructor in Agronomy
- Israelsen, Orson W.**, B.S., M.S., Ph.D.,
Professor of Irrigation and Drainage
- Israelsen, Vernon L.**, B.S., M.A., Ph.D.,
Professor of Agricultural Economics and Marketing
- Jacobsen, Ernest A.**, A.B., M.A., Ed.D.,
Professor of Education
Dean, School of Education
- Jenkins, Woodrow R.**, B.S., M.S.,
Assistant Professor, Extension Poultryman
- Jennings, David S.**, B.S., Ph.D.,
Professor of Soils
- Jensen, J. O.**, B.S.,
Assistant Professor of Physics
- Jensen, Louis A.**, B.S.,
Assistant Professor, County Extension Agent, Duchesne County
- Jensen, Myrtle R.**, B.S.,
Instructor in Elementary Training School
- Jensen, Naomi**, B.S.,
Assistant Professor, Home Demonstration Agent, Summit County
- *Jeppsen, Ernest C.**, B.S., M.S.,
Professor of Industrial Education
Chairman, Division of Technology
- Johner, Val M.**, SFC, Ord. (DEML),
Instructor in Military Science and Tactics

- Johnson, Bertha F.**, B.S., M.A.,
Professor of Textiles and Clothing
- Johnson, Eric A.**, B.S.,
Purchasing Agent and Manager of Bookstore
- Johnson, Theta**, B.S.,
Assistant Professor and Clothing Specialist
- Jones, E. LeRoi**, B.A., M.A.,
Assistant Professor of Speech
- Jones, Lewis W.**, B.S., M.S.,
Associate Professor of Bacteriology
- Jones, William L.**, B.S., E.E., M.S.,
Assistant Professor of Radio
- Kearsley, Amy R.**, B.S., M.A.,
Associate Professor, Home Demonstration Agent, Cache County
- Keck, Wendell M.**, B.A., M.A., Ph.D.,
Associate Professor of English
- Keetch, Russell R.**, B.S.,
Associate Professor, County Extension Agent, Sanpete County
- Kelker, George Hills**, A.B., B.S.F., M.S.F., D.Sc.,
Professor of Wildlife Management
- Kemp, Anton B.**,
Instructor in Welding
- Kendall, Quentin L.**, Lt. Colonel, QMC,
Assistant Professor of Military Science and Tactics
Director QMC
- Kennington, Sigrid S.**, B.S., M.S.,
Instructor in Chemistry
- Kepner, Harold R.**, A.B., S.B., S.M.,
Professor of Civil Engineering
- Kepner, Janet**
Instructor in English
- Kilburn, A. Golden**, B.S.,
Associate Professor, Extension Soil Conservationist
- Kirk, Odeal C.**, B.S.,
Superintendent, Ogden Substation
- Kitchen, Melvin R.**, B.S.,
Assistant Professor, County Extension Agent, Piute County
- Kitzhaber, Albert R.**,
Assistant Professor of English
- Klein, Louis, Jr.**,
Instructor in Aeronautics
- Knowlton, George F.**, B.S., M.S., Ph.D.,
Professor of Entomology
Extension Entomologist
- Krumperman, Paul H.**, B.S.,
Instructor in Bacteriology and Public Health
- Lamborn, Ellis W.**, B.S., M.S., Ph.D.,
Assistant Professor of Agricultural Economics and Marketing

UTAH STATE AGRICULTURAL COLLEGE

- Larsen, Geneal,**
Secretary to the President
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Associate Professor of Art
- Larson, Paul B., B.S., M.S.,**
Associate Professor of Dairying
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Assistant Professor of Chemistry
- Leonard M. Prentice,**
Superintendent, Farmington Substation
- Lewis, Evelyn Hodges, B.S., A.M.,**
Assistant Professor of Sociology
- Linford, Gene H., B.S., M.S.,**
Instructor in Zoology
- Linford, Howard B., B.S.,**
Assistant Professor of Physical Education
Assistant Coach
- Lipphardt, Carmen C., B.S., M.S.,**
Assistant Professor, Home Demonstration Agent, Iron County
- Logan, Ida M., B.S.,**
Assistant Librarian
- Loll, Leo M., Jr., A.B., M.B.A.,**
Assistant Professor of Economics
- Low, J. B., B.S., M.S., Ph.D.,**
Associate Professor of Wildlife Management
Leader, Utah Cooperative Wildlife Research Unit
- Ludlow, Daniel H., B.S.,**
Instructor in English
- Lund, Nettie B., B.S.,**
Associate Professor, Home Demonstration Agent, Salt Lake City
- Lyons, Joseph W., Captain OMC,**
Assistant Professor of Military Science and Tactics
- *Madsen, Milton A., B.S., M.S.,**
Assistant Professor of Animal Husbandry
Non-Resident Professor of Botany
- Maeser, Sherwin, A.B., Ph.D.,**
Professor of Chemistry
- Maguire, Basset, B.S., Ph.D.,**
Curator, New York Botanical Garden
- Marston, Paul, B.S.,**
Assistant Professor of Physical Education
Assistant Coach
- Martin, Maude, B.S.,**
Associate Professor, Home Demonstration Agent, Weber County
- Matthews, Darrell, B.S.,**
Assistant Professor, County Extension Agent, Emery County
- Matthews, Doyle J., B.S.,**
Instructor in Animal Husbandry

- McAllister, DeVere R.**, B.S., M.S.,
Assistant Professor of Agronomy
- McBride, C. D.**, B.S., M.S.,
Assistant Professor of Industrial Education
Supervisor of On-the-Job Training
- McDonald, Leonard W.**, B.S.,
Publications Specialist
Executive Secretary, Alumni Association
Director, Div. of College Development and Alumni Relations
- McGinn, Norman J.**, S/Sgt., USAF,
Instructor in Air Science and Tactics
- Mecham, Merlin J.**, B.S., M.S.,
Instructor in Speech
- Melinkovich, George**, B.S.,
Assistant Professor of Physical Education
Head Football Coach
- Merkley, Charles N.**, B.S.,
Associate Professor of Woodwork and Building Construction
- Merkley, Margaret B.**, B.S.,
Instructor in Home Economics
- Merrill, Milton R.**, B.S., M.A.,
Professor of Political Science
Dean, School of Commerce
- Meyer, George A.**, B.A., S.T.B., Ph.D.,
Professor of Modern Languages
- Michaelson, Leon**, B.S., M.S.,
Assistant Professor, Extension Marketing Specialist
- Miller, Elna**, B.S., M.S.,
Professor, Extension Nutritionist
- Milligan, Cleve H.**, B.S., M.S.,
Professor of Irrigation and Drainage
- Miner, Merthyr L.**, B.S., D.V.M.,
Research Associate Professor of Veterinary Science
- Moore, James Reed**, B.S.,
Assistant Professor, County Extension Agent, Kane County
- Moore, Raymond R.**, B.S., M.S.F.,
Associate Professor of Forestry
Extension Forester
- Morgan, Floyd T.**, B.S., M.A.,
Associate Professor of Speech
- Morris, Arthur J.**, B.S., M.S.,
Professor of Dairy Manufacturing
Extension Dairy Manufacturing Specialist
Assistant Dean, School of Agriculture
- Morris, Laval S.**, B.S., M.S., M.L.A.,
Professor of Landscape Architecture and Planning
- *Morris, Lawrence**, B.S., M.S., Ph.D.,
Professor of Poultry Husbandry
Extension Poultry Specialist

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- Morrison, Ernest M., B.S., M.S.,**
Associate Professor of Agricultural Economics and Marketing
- Mortimer, William E., B.S., M.S.,**
Professor of Industrial Education
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Instructor in Chemistry
- Murray, Evan B., B.S., M.S.,**
Professor of Economics
- Myers, Chester J., B.S., A.M., Ph.D.,**
Professor of Speech
- Nelson, Dale O., B.S., M.S.,**
Assistant Professor of Physical Education
- Nelson, George,**
Trainer
Wrestling Coach
Instructor in Physical Education
- Nelson, Jesse G., A.B.,**
Instructor in Languages
- Nelson, Mary, B.A., M.S.,**
Assistant Professor in Mathematics
- Nelson, Ray, B.S.,**
Lecturer in Journalism
- Neuberger, L. Mark, B.S., M.S.,**
Professor of Accounting and Business Administration
- Nichols, DeLore, B.S.,**
Professor, County Extension Agent, Davis County
- Nichols, Fern S., A.B.,**
Instructor in Elementary Training School
- Nichols, Mark**
Professor of Vocational Education
- Nielsen, Harold M., B.S., M.S.,**
Research Assistant Professor of Veterinary Science
- Nielsen, Marion L., B.S., M.A., Ph.D.,**
Associate Professor of Languages
- Nielsen, Rex, B.S., M.S.,**
Instructor in Agronomy
- Nielsen, Sarah S., B.S.,**
Assistant Professor, Home Demonstration Agent, Millard County
- Nielsen, Veneta L., B.S., M.S.,**
Instructor in English
- Noble, LeGrande G., B.S., M.S., Ed.D.,**
Director of Extension Class Work,
Home Study and Visual Education
Professor of Education
- Nyman, Ross A.,**
Instructor in Woodwork and Building Construction
- Owen, John L., M/Sgt., FA (DEML),**
Instructor in Military Science and Tactics

- Packer, J. Elmo, B.S.,**
Research Assistant in Dairy Husbandry
- Packman, Samuel L., M/Sgt., AGD (DEML),**
Instructor in Military Science and Tactics
Sergeant Major
- Page, Edna, B.S., M.A.,**
Associate Professor of Foods
- Pahtz, George,**
Instructor in Instrumental Music
- Palfreyman, Bernice, B.S.,**
Assistant Professor, Home Demonstration Agent, Sanpete County
- Parkinson, LaRue, B.S.,**
Instructor in Elementary Training School
- Parrish, Joseph F., B.S.,**
Associate Professor, County Extension Agent, Salt Lake County
- Paulson, Margaret**
Assistant Professor, Home Demonstration Agent, Carbon County
- Pedersen, Anker C., Major, QMC,**
Assistant Professor of Military Science and Tactics
- Perry, Jack R., M/Sgt., USAF,**
Instructor in Air Science and Tactics
- Perry, Mignon, B.S., M.S.,**
Assistant Professor in Clothing and Textiles
- Perry, Rolland, A.B., Ph.D.,**
Professor of Physics
- Peterson, Dean F., Sr., B.S., M.S.,**
Instructor in Mathematics
- Peterson, Howard B., B.A., M.A., Ph.D.,**
Associate Professor of Soils
- *Peterson, Myrtle D., B.S., M.A.,**
Professor, Assistant Extension Director for Home Economics
- Petrov, Peter M., CWO, USAF,**
Assistant Professor of Air Science and Tactics
Air Force Administrative Assistant
- Pittman, Don W., B.S., M.S.,**
Professor of Soils
- Pocock, C. Lester, B.S.,**
Chairman of Public Relations
- Pollard, Leonard H., B.S., M.S., Ph.D.,**
Professor of Vegetable Crops
- Porter, Blondell,**
Assistant Librarian
- Porter, Helen, B.A., M.A.,**
Associate Professor of Child Development
- Porter, Gordon, B.S.,**
Instructor in Modern Languages
- Poulsen, Jenniev J., B.S.,**
Assistant Professor, Home Demonstration Agent, Utah County

UTAH STATE AGRICULTURAL COLLEGE

- Poulsen, Margaret,**
Assistant Professor, Home Demonstration Agent, Carbon County
- Preactor, Frederick, B.S., M.Ed.,**
Professor of Metalwork
- Preston, William Bowker, M.D.,**
Health Supervisor of Students
Professor of Physiology
- Price, Lew Mar, B.S.,**
Professor, County Extension Agent, Sevier County
- Pryor, Fred R., B.S.,**
Instructor in Photography
- Pugh, Lloyd R., Jr., 1st Lt., USAF,**
Assistant Professor of Air Science and Tactics
- Pugmire, Oral, B.S.,**
Instructor in Child Development
- Reynolds, H. Reuben,** Graduate of Chicago Art Institute,
Professor of Art
- Rice, Moyle Q., B.S., M.A.,**
Associate Professor of English
- Rich, Lyman H., B.S., M.S.,**
Associate Professor, Extension Dairyman
- Richards, B. L., B.S., M.S., Ph.D.,**
Professor of Botany and Plant Pathology
- Richards, Ralph, B.S.,**
Associate Registrar
- Richardson, Ralph W., Captain, QMC,**
Assistant Professor of Military Science and Tactics
- Rickenbach, Rodney G., B.S.,**
Assistant Professor, County Extension Agent, Millard County
- Ricks, Joel E., A.B., A.M., Ph.D.,**
Professor of History
- Robertson, Von H., B.S.,**
Non-resident Professor of Trades and Industrial Education
- Robinson, Rex E., B.S., M.A., Ph.D.,**
Associate Professor of Speech
- Rogers, Lee, B.S.,**
Instructor, Assistant County Agent, Millard County
- Rosenthal, Willis M., B.A., M.A., B.D.,**
Special Instructor in English and Speech
- Roskelley, R. Welling, B.S., M.S., Ph.D.,**
Professor of Sociology
Extension Sociologist
- Roth, Floyd E., Major, USAF,**
Assistant Professor of Air Science and Tactics
- Rowland, Priscilla, B.S., M.S.,**
Assistant Professor in Foods
- Sabine, John S., Lt. Colonel, CAC,**
Assistant Professor of Military Science and Tactics
Director Artillery

- Salyers, Thomas D.**, SFC, Ord. (DEML),
Instructor in Military Science and Tactics
Automotive Mechanic
- Sawyer, Ferdinand F.**, Major, QMC,
Assistant Professor of Military Science and Tactics
- Senob, Alice**, A.B., A.M., Ph.D.,
Assistant Professor of English
- Sharp, David, Jr.**, B.S.,
Professor, Supervisor, Extension Youth Programs
- Sharp, Heber Cannon**, B.S., M.S.,
Associate Professor of Psychology
- Sharp, J. Cecil**, B.S.,
Assistant Professor of Air Conditioning and Refrigeration
- Shaw, Edith Smith**, B.S.,
Assistant Professor of Education
Supervisor of Elementary Teacher Training
- Shaw, G. Merrill**, B.S.,
Assistant Professor of Metalwork and Mechanical Drawing
- Shipley, Fern**, B.S., M.A.,
Associate Professor, Assistant Supervisor,
Extension Youth Programs
- Shiozawa, Kenji**, B.S., M.S.,
Instructor in Landscape Architecture
- Sigler, William F.**, B.S., M.S., Ph.D.,
Professor of Wildlife Management
- Slaugh, Owen**,
Instructor in Automotive Mechanics
- Smith, Albert E.**, B.S.,
Professor, County Extension Agent, Tooele County
- Smith, Anne**, B.S., B.L.S.,
Instructor in Library Science
- Smith, Arthur D.**, B.S., M.S.,
Associate Professor of Range Management
- Smith, Eleanor S.**, B.S.,
Assistant Professor, Home Demonstration Agent,
Washington County
- Smith, Hubert W.**, B.S., M.A., Ph.D.,
Associate Professor of English
- Smith, Ruby K.**, B.S.,
Assistant Professor, Home Demonstration Agent, Tooele County
- Smith, Winslow Whitney**, A.B., A.M., Ph.D.,
Professor of Bacteriology and Public Health
- Somers, Karl W.**, B.S.,
Assistant Professor in Metalwork
- Speed, Walter B.**, 1st Sgt. USAF,
Instructor in Air Science and Tactics
- Sperry, Elaine**, B.S.,
Assistant Professor, Home Demonstration Agent, Sevier County
- Stanford, J. Sedley**, B.S., Ph.D.,
Associate Professor of Zoology and Entomology

UTAH STATE AGRICULTURAL COLLEGE

- Steffen, Hyrum, B.S.,**
Assistant Professor of Poultry
- Stephenson, Alfred B., B.S., M.S., Ph.D.,**
Assistant Professor of Animal Husbandry
- Stevens, Kenneth R., B.S., Ph.D.,**
Professor of Bacteriology and Public Health
- Stewart, Charles T., B.A., M.A.,**
Assistant Professor of Economics
- Stewart, George, B.S., M.S., Ph.D.,**
Senior Ecologist, Intermountain Forest and Range Experiment
Station, Non-resident Professor of Range Management and
Agronomy
- Stewart, John J., B.S.,**
Assistant Professor of Journalism
- Stevens, Velyn B., B.S.,**
Assistant Professor, Home Demonstration Agent, Utah County
- Stock, Elden M., B.S., M.S., C.E.,**
Professor of Civil Engineering
- Stoddard, Dan W., B.S.,**
Instructor of Mathematics
- Stoddard, Lawrence A., B.S., M.S., Ph.D.,**
Professor of Range Management
- Stoker, Golden L., B.S., M.S.,**
Assistant Professor of Agronomy
- Stokes, L. Darrell, B.S.,**
Assistant Professor, County Extension Agent, Wasatch County
- Stone, David R., B.A., M.A., Ph.D.,**
Associate Professor of Psychology
- Summers, Lowell P., B.S.,**
Assistant Professor in Aeronautics
- Swenson, Dan H., B.S., M.S.,**
Instructor of Woodwork and Building Construction
- Swindle, Carma P., B.S.,**
Assistant Professor, Home Demonstration Agent, Davis County
- Symons, Joseph N., B.S., M.S., Ph.D.,**
Professor of Sociology
- Taylor, Morris H., B.S., M.S.,**
Assistant Professor, Extension Cattle Marketing Specialist
- Taylor, Sterling A., B.S., M.S., Ph.D.,**
Assistant Professor of Agronomy
- Thain, Aldyth, B.S., M.A.,**
Assistant Professor of Languages
- Thatcher, Ray A., B.S.,**
Assistant Professor, County Extension Agent, Morgan County
- Thomas, W. Preston, B.S., M.S., Ph.D.,**
Professor of Agricultural Economics and Marketing
Extension Economist
- Thorne, D. Wynne, B.S., M.S., Ph.D.,**
Professor of Agronomy

- Thornley, Gwendella**, B.S., M.S.,
Instructor in Speech
- Thorpe, Everett C.**, B.S.,
Assistant Professor of Art
- Tingey, D. C.**, B.S., M.A.,
Professor of Agronomy
- Tingey, V. H.**, B.S., M.S.,
Professor of Mathematics
- Tingey, Willis A.**, B.S.,
Assistant Professor of Civil Engineering
- Tippets, Ruth P.**, B.S.,
Associate Professor,
Consumer Education Specialist
- Tueller, Lamont E.**, B.S.,
Associate Professor, County Extension Agent, Cache County
- Turner, Lewis M.**, B.S., M.S., Ph.D.,
Professor of Forestry
Dean, School of Forest, Range, and Wildlife Management
- Twitty, William M.**, Captain, QMC,
Assistant Professor of Military Science and Tactics
- *Vanderhoff, Kenneth**, B.S.,
Assistant Professor of Physical Education
- Van Shaar, Ben**, B.S., M.Ed.,
Manager of College Housing
Assistant Professor of Education
- Van Orden, Harris O.**, B.S., M.S.,
Associate Professor of Chemistry
- Vermillion, Una**, A.B., M.A.,
Professor of Institutional Management
Manager of Cafeteria
- Vickers, Wallace J.**, B.S., M.A., Ph.D.,
Professor of English
- Wadsworth, Harold M.**, B.S.,
Superintendent of Buildings and Grounds
- Wadsworth, J. Donald**, B.S.,
Assistant Professor of Welding
- Walker, R. H.**, B.S., M.S., Ph.D.,
Professor of Agriculture
Director of Agricultural Experiment Station
Dean, School of Agriculture
- *Walton, Thelma G.**, B.S.,
Assistant Professor, Home Demonstration Agent, San Juan County
- Wamsley, Helen I.**, B.S.,
Assistant Professor, Home Demonstration Agent, Rich County
- Wann, F. B.**, A.B., Ph.D.,
Professor of Botany
- Wardrop, Harvey R.**, M/Sgt., DEML,
Instructor in Military Science and Tactics

UTAH STATE AGRICULTURAL COLLEGE

- Watkins, Carol C.,**
Asst. Professor, Home Demonstration Agent, Washington County
- Watkins, Reynold K., B.S., S.M.,**
Assistant Professor of Civil Engineering
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Instructor in Physical Education
- Welti, Walter, B.A., M.A.,**
Professor of Vocal Music
- West, Clara Pearson, A.B., M.S.,**
Assistant Professor of Accounting and Administration
- Whitaker, William C., B.S.**
Asst. Professor, Acting County Extension Agent, Sanpete County
- Whitesides, Joseph E., B.S.,**
Assistant Professor of Physical Education
Director of Athletics
- Whitney, Mary E., B.S., M.A.,**
Assistant Professor of Physical Education
- Willie, Vernal, B.S.,**
Instructor, Assistant County Extension Agent, Box Elder County
- Wilcox, Ethelwyn B., B.S., M.S., Ph.D.,**
Professor of Nutrition
- Wiley, Lynn, B.S.,**
Instructor in Auto Body Mechanics
- Williams, J. Stewart, B.S., M.A., Ph.D.,**
Professor of Geology
- Wilson, LeMoyne, B.S., M.S.,**
Assistant Professor of Agronomy
- Wilson, Ramon, B.S., M.S.,**
Assistant Professor, Extension Economist
- Wilson, Warren B., B.S., M.A.,**
Instructor in Art
- Woodruff, Angus Q., B.S.,**
Instructor in Air Conditioning and Refrigeration
- Wrigley, R. L., B.S.,**
Professor, Assistant Extension Director and Supervisor of
Extension Agricultural Programs
- Yao, T. C., B.S., M.S.,**
Research Assistant in Chemistry

FEDERAL COLLABORATORS

- Barrett, Willis C., B.S., C.E.,**
Soil Conservation Service
- Bassett, Day L., B.S.,**
Bureau of Plant Industry, Soils and Agricultural Engineering
- Bohart, George E., B.S., Ph.D.,**
Bureau of Entomology and Plant Quarantine
- Cannon, Orson S., B.S., M.S., Ph.D.,**
Bureau of Plant, Soils and Agricultural Engineering

- Carlson, John W.**, B.S., M.S., Ph.D.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Clarke, Alfred E.**, B.A., M.Sc., Ph.D.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Clyde, George D.**, B.S., M.S.,
Chief, Division of Irrigation, Soil Conservation Service
- Dorst, Howard E.**, A.B., M.A.,
Bureau of Entomology and Plant Quarantine
- Haddock, Jay L.**, B.S., M.S., Ph.D.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Hawthorn, Leslie R.**, B.S., M.S.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Hochmuth, Harold R.**, B.S., M.S.,
Bureau of Agricultural Economics
- Hugie, Vern K.**, B.S., M.S.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Kaloostian, George H.**, B.S., M.S.,
Bureau of Entomology and Plant Quarantine
- Keller, Wesley**, B.S., M.S., Ph.D.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Lauritzen, C. W.**, B.S., M.S., Ph.D.,
Soil Conservation Service
- Lieberman, Frank V.**, B.S.,
Bureau of Entomology and Plant Quarantine
- Linton, Denton C.**, B.S.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Maughan, J. Howard**, B.S., M.S.,
Soil Conservation Service
- Meilke, James L.**, B.S.F., M.S., Ph.D.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Nye, William P.**, B.S., M.S.,
Bureau of Entomology and Plant Quarantine
- Peay, Walter E.**, B.S., M.S.,
Bureau of Entomology and Plant Quarantine
- Pearson, Gregory L.**, B.S., M.S.,
Soil Conservation Service
- Pedersen, Marion W.**, B.S., M.S.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Rasmussen, Warren**, B.S.,
Soil Conservation Service
- Reuss, Lawrence A.**, B.S., M.S.,
Bureau of Agricultural Economics
- Snow, Sterling J.**, B.S.,
Bureau of Entomology and Plant Quarantine
- Thorne, James P.**, B.S., M.S.,
Soil Conservation Service
- Thornley, Heber F.**, B.S., M.S.,
Bureau of Entomology and Plant Quarantine

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- Timmons, F. L.**, B.S., M.S.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Trussell, Daniel F.**, B.S.,
Soil Conservation Service
- Wadley, Bryce N.**, B.S., M.S., Ph.D.,
Bureau of Plant Industry, Soils and Agricultural Engineering
- Woodward, Rollo W.**, B.S., M.S., Ph.D.,
Bureau of Plant Industry, Soils and Agricultural Engineering

NURSING EDUCATION

Faculty at L.D.S. Hospital, Logan

Margery M. Selm, R.N., B.S., Director of Nursing Education

- Aldous, A.**, B.S.
- Barlow, R. N.**, M.D.
- Budge, Edward**, M.D.
- Budge, O. W.**, M.D.
- Budge, Omar S.**, M.D.
- Budge, S. M.**, M.D.
- Cragun, W. E.**, M.D.
- Funk, A.**, R.N., B.S.
- Gasser, G. W.**, M.D.
- Hayward, J. Clare**, M.D.
- Hayward, W. H.**, M.D.
- Houy, M.**, R.N.
- Knight, G.**, R.N.
- Loken, D.**, R.N., B.S.
- Porter, R. O.**, M.D.
- Reynolds, Z.**, R.N., B.S.
- Riter, K. C.**, M.D.
- Sessions, L. J.**, B.S.

BRANCH AGRICULTURAL COLLEGE

Officers of Administration

- Driggs, H. Wayne**, B.A., M.A., Ph.D.,
Director, Branch Agricultural College
- Cooley, Hazen**, B.S., M.B.A.,
Assistant Secretary and Treasurer
- Plummer, J. H.**, B.A., M.A.,
Registrar
Dean of Students

- Swindle, Karma P., B.S.,**
Dean of Women
- Robb, Ward S.,**
Office Assistant
- Houchen, Blanche,**
Supervisor of Women's Residence Hall
- Cloward, McRay,**
Manager of Bookstore and Student Housing
- Matheson, Edward G.,**
Superintendent of Buildings and Grounds
- Ashcroft, Theron, B.S.,**
Associate Professor of Physics and Engineering
Chairman, Division of Engineering and Mathematics
- Bastow, Mary Lovina, B.S.,**
Associate Professor of Arts and Textiles
- Bell, T. Donald, B.S., M.S., Ph.D.,**
Professor of Animal Husbandry
Chairman, Division of Agriculture
- Cooley, Charles B., B.S., M.Ed.,**
Associate Professor of Industrial and Vocational Education
Chairman, Division of Industrial and Vocational Education
- Cooley, Hazen, B.S., M.B.A.,**
Associate Professor of Business
- Dalley, Parley, B.S., M.S.,**
Professor of Physical Sciences
Chairman, Division of Physical Sciences
- Davis, Victor, A.S.,**
Instructor in Auto Mechanics
- Driggs, H. Wayne, B.A., M.A., Ph.D.,**
Professor of English and Education
- Graber, Fredrick L., T/Sgt.,**
Instructor in Military Science
- Halverson, Roy L., B.S.,**
Associate Professor of Music
- Hardy, Eugene, B.S.,**
Assistant Professor of Auto Mechanics
- Harris, Oliver W., Major U.S.A.F.,**
Associate Professor in Military Science and Tactics
Chairman, Division of Military Science and Tactics
- Hatch, Conrad V., B.S.,**
Instructor in Mathematics and Chemistry
- Hill, Walter R., T/Sgt.,**
Instructor in Military Science
- Kimball, Fern, B.S.,**
Instructor in Home Economics and Institutional Management
- Kupfer, Vern K., B.S., M.S.,**
Instructor in Psychology and Social Science
- Lamb, Ann, B.S.,**
Instructor in Physical Education

UTAH STATE AGRICULTURAL COLLEGE

- LeBaron, George L., B.S.,**
Instructor in Physics and Radio
- Lindquist, Ray, B.S.,**
Instructor in Physical Education
Director of Physical Education
Athletic Coach
- Magleby, V. R., B.S.,**
Assistant Professor of Agriculture and Biology
- Manning, Wm. H., A.B.,**
Professor of Voice and Theory
Chairman, Division of Music
- Maughan, Murray, B.S.,**
Instructor in Physical Education
Athletic Coach
- Maughan, Reese P., B.S., M.A., Ed.D.,**
Professor of Education
Chairman, Division of Education
- McMillan, Mary, B.S., M.A.,**
Instructor, Elementary Education
Supervisor of Teacher Training
- Nelson, Donald K., B.S., B.L.S., M.B.A.,**
Assistant Professor of English
Librarian
- Olsen, Floris S., B.S.,**
Instructor in Secretarial Science
- Peterson, Edwin L., B.S., M.A.,**
Assistant Professor of Social Science
Chairman, Division of Social Sciences
- Plummer, H. J., B.A., M.A.,**
Assistant Professor of English
- Robinson, Max E., B.S., M.S.,**
Assistant Professor of Range Management
- Rowley, Richard M., B.S.,**
Instructor in English
- Sargent, David L., B.S., M.S.,**
Professor of Biology
Chairman, Division of Biological Sciences
- Schmutz, Clarence, B.A., M.A.,**
Associate Professor of Agricultural Economics
- Stephensen, A. W., B.S., M.B.A.,**
Assistant Professor of Commerce
Chairman, Division of Commerce
- Swindle, Karma P., B.S.,**
Assistant Professor of Home Economics
- Tippetts, Twain, B.A., M.A.,**
Assistant Professor of English
Chairman, Division of English
- Wahlquist, A. Glenn, B.S.,**
Instructor in Agriculture and Biology
-
Assistant Professor, Military Science and Tactics
-
Instructor in Modern Languages

INTRODUCTION

General Information	34
Physical Plant	36
Student Organizations	40
Alumni Association	41
Academic Regulations	43
Admission	43
Registration and Credits	45
Lower Division	47
Group Requirements	47
Upper Division	48
Graduation	49
Requirements for High School Teaching Certificate	51
Graduate School	52
Admission	52
Master of Science Degree	53
Doctor of Philosophy Degree	55
Student Expenses	56
Fees	57
Scholarships, Fellowships, Awards	58
Special Student Services	64

General Information

LOCATION

UTAH State Agricultural College is in Logan, Cache County. The city is a typical college town of 16,000 inhabitants. Highways 89 and 91 intersect at Logan, and the town is served by the Burlington Trailways bus line, the Greyhound bus line, and the Union Pacific Railroad for freight service. The College is located one mile east of the business section of Logan on a hill overlooking the valley.

POLICY

Utah State Agricultural College in its fundamental policy has always considered the main function of education to be the preservation and improvement of the democratic way of life.

The College provides a full educational offering in the seven schools of instruction. In accordance with the spirit of the law under which it was organized, the College provides a liberal, thorough, and practical education. The two extremes in education, empiricism and the purely theoretical, are avoided; for the practical is based upon and united with the thoroughly scientific. In addition to the practical work of the different courses, students are given excellent training in the sciences, mathematics, history, English, art, music, speech, modern languages, and other related subjects. The object is to foster all that makes for right living, good citizenship, high efficiency, and general culture.

Under this general policy, the special purpose of the College is to be of service in the building of the State and the great West to which it belongs. The instruction in Agriculture, Engineering, Forest, Range, and Wildlife Management, in addition to the purely professional aspects of these fields of study, deals with the special problems relating to the conquest of the great areas of unoccupied lands, the development of engineering structures, the proper use of the water supply, and the kinds of crops or livestock which in Utah and the West may be most profitable. Instruction in mechanic arts points out the most promising trades and teaches them in such a way as to meet the needs of the area. Instruction in Commerce relates to the undeveloped resources and the present commercial conditions of the State, and investigates the principles and methods to be applied in the commercial growth of Utah. The School of Home Economics offers training in the various phases of homemaking and for professional life. In the School of Education students are given the professional training which qualifies them for teaching and school administrative positions.

The Constitution of Utah establishes Utah State Agricultural College and the University of Utah as the two State institutions of higher learning. Each of these institutions is independent in government, although each is a part of the public school system. Each, under the Constitution and the Statutes of Utah and in harmony with the ruling of its governing board, offers undergraduate and graduate work leading to the Bachelor's and Master's degrees. The College, in addition to this high status given it in Utah under the Constitution, is one of the fifty-one Land-Grant institutions in the United States designated by the Federal Government as the institutions of higher learning in the respective states for the development of the Federal program of education included in the Morrill and Nelson Acts of the Federal Congress.

HISTORY

Utah State Agricultural College, the Experiment Station and the Extension Service exist today because of far-sighted legislation which created, stated the purposes, and set forth the fields of activity of these divisions. The Morrill Act of 1862 provided for the establishment of Land-Grant Colleges by the grant

of Federal lands thus providing a material basis for these institutions. Utah received 200,000 acres. The Second Morrill Act of 1890 carried an annual appropriation to each college; the sum to be spent for instruction in designated fields. Additional Federal legislation increased the financial aid to the institution, including the Hatch Act of 1887 for experimental purposes, the Smith-Lever Act of 1914 to aid in beginning and developing extension work, and more recently, the Bankhead-Jones Act which supports all three divisions in some degree. All these acts constituted the basis of Federal participation in the extension of college education and rural agricultural development to the masses of American people. It was a democratic movement in education. Participation by the Territory of Utah in the Federal program of education came through the passage of an act "to establish an Agricultural College and an Agricultural Experiment Station." This bill, introduced into the legislature by Representative Anthon H. Lund on February 27, 1888, unanimously passed both houses and was signed by Governor Caleb West, March 8, 1888.

The purposes of the college have been stated in Federal and Territorial acts. The Federal Land Grant Act of 1862 explained that the colleges were, "without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." The Territorial Act of 1888 confirmed these purposes and defined the fields of instruction offered by the college to include "the English language and literature, mathematics, civil engineering, agricultural chemistry, animal and vegetable anatomy, physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed, technology, political, rural and household economy, horticulture, moral philosophy, history, bookkeeping, and especially the application of science and mechanical arts to the practical agriculture in the field." Though the fields of education increased in number and scope and additional subjects were added to the curriculum in harmony with subsequent legislative acts, each president of the college has reaffirmed the purposes as set forth by the Federal and Territorial founders of the school.

The necessary legislation having been enacted to set up the machinery, the next important task was to establish the college concretely. The Lund Act declared the school should be erected "at any place in Cache county that may be designated by the trustees." Logan and Cache county gave the present site of one hundred acres and in 1889, the contract for the south wing of the main building was let to the contractors. Professor J. W. Sanborn of New Hampshire was chosen as director of the Experiment Station, and in 1890, he came to Utah, arriving in Logan in January. The wing of the building was completed, members were chosen for the experiment station and the college staff, and in September 1890, the college opened its doors to prospective students. President Sanborn, Professors W. P. Cutter, E. S. Richman, John T. Caine, Jr., Abby Marlatt, A. A. Mills, Jacob Sholl, H. C. Everett, and Sarah Goodwin formed the first faculty. The student body of 1890-1891 totaled 139, many of them being below the college rank of those days.

Since its beginning in 1890, seven presidents have guided the destinies of the college. Following President Sanborn came President J. H. Paul in 1894, President J. M. Tanner in 1896, President W. J. Kerr in 1900, President John A. Widtsoe in 1907, and President E. G. Peterson in 1916. Dr. Franklin S. Harris, in taking over in 1945, became the seventh president of the institution. From one building in 1890, the number of buildings has reached thirty-eight, plus many temporary buildings of various sizes. The college faculty has grown from 9 in 1890 to nearly 500 in 1949, and the student body has expanded from 139 in the beginning to a cumulative total of the regular school year of 5052 regularly enrolled students in 1948-49. In addition, there were several hundred students in "related instruction" courses.

Seven schools: Agriculture, Arts and Sciences, Commerce, Education, Engineering and Technology, Forest, Range, and Wildlife Management, and Home Economics, provide professional and cultural training. The institution is on the accepted list of the Association of American Universities and the American Association of University Women. In 1929 the name of the college was changed from Utah Agricultural College to Utah State Agricultural College.

PHYSICAL PLANT

The physical plant of the College has been built over a period of half a century, and comprises one of the most beautiful college campuses in the whole country. It occupies more than ninety acres of the large delta built up of gravels and sediments brought down from the Wasatch Mountains to the east by Logan River into ancient Lake Bonneville over thousands of years. Many of the structures and landscape features of the campus still suggest something of the doings of nature in that remote past. Alterations and carvings of the old lake delta into beautiful terraces, curves and elevations, during the times of its ups and downs and since the last recession of the ancient lake to its present Salt Lake remnant, are still outstanding features. Viewed from College Hill in any direction, north, south, east or west, the mountains, the valley, the green fields, meandering streams, and the distant horizons with their angular profiles against clear blue skies, all provide pleasure and inspiration.

Buildings and Facilities

To house its varied and growing educational and research activities, the College now has 38 carefully planned, mostly modern, steam-heated and well lighted buildings on the campus. Identified with each building or group of buildings are to be found centers of student activities and interests which largely go to make up the undergraduate life at the College.

The Main Building, so called, a three-story brick structure 350 feet long, is the landmark in the history of the institution. This building, whose halls and classrooms have resounded to the voices of the classes coming and going since the College was founded nearly 60 years ago, is the hub about which most activities revolve. In it are located the administrative and the business offices of the College and Experiment Station, the department of Agricultural Economics, Art, Education, Geology, Landscape Architecture, Mathematics, Modern Languages, Music, Psychology, Sociology, Speech, Zoology, and the Schools of Arts and Sciences and Commerce. The College bookstore is in the basement. The main auditorium, meeting place for most student gatherings, is located in the east wing of the building. A Studio Theatre, used by the Speech department, is on the second floor, west wing. The offices of the Dean of Students, Dean of Women, and the officials who supervise war veteran enrollees are on the first floor, north wing.

A combination Home Economics and Commons Building, perhaps the most imposing and carefully planned building on the campus for its multiple purposes, is the social and cultural center of the College. It is used exclusively for College functions, the students and faculty alike taking advantage of the facilities offered in the way of lounges, reception and ball rooms. The building also houses a cafeteria with well-equipped kitchens and dining rooms for the comfort and convenience of students and faculty. Educationally, this structure functions on the campus as the housing quarters of the School of Home Economics and classes in Physiology. These departments are provided with ample space in modern, well-lighted classrooms and laboratories. All research and practice laboratories are provided with standard, scientific equipment. Student Body offices are also in this building.

The Thomas Smart Gymnasium, erected in 1912, is still the center of much athletic activity. It houses offices of the Department of Physical Education for men and women, indoor and intramural sports, and the offices of the College physician and school nurse.

The Field House, a spacious steel and brick structure, 356 feet long by 137 feet wide, completed in 1939, is used for many activities. Besides being the center of College competitive athletics, the building is used for other large college and public gatherings. Especially, since the size of the student body became a problem, has the Field House demonstrated its multiple purpose usefulness by providing adequate space for commencement exercises. It is equipped with an excellent basketball playing floor and a seating capacity of 4,000. For indoor tennis, track, softball and football practice, the building is ideal. Also it is used for certain military activities, and other large functions.

A companion building to the Field House, completed in 1940, is the Military Science Building, located just to the east with a corridor connection between the two. This brick-concrete structure, 50 feet by 180 feet, is provided with excellent offices, classrooms, rifle ranges, gun and equipment supply rooms. A large gun shed is part of the building. Because of its association with the Field House, military training the year 'round is greatly facilitated.

The Extension Service Building, one of the old buildings, is a two-story brick structure. It was originally occupied by the Experiment Station Staff. Since the Extension Service became an important function of the institution, this building has been occupied by the Extension staff, and is now the headquarters of a state-wide educational service organization, maintained by the College and Federal Government jointly.

Widtsoe Hall, a three-story, brick-concrete building, was constructed in 1915. It is wholly occupied by the Departments of Chemistry, Physics, and Experiment Station Laboratories. All classrooms are well lighted and heated, and provided with desks and equipment for teaching demonstrations and experiments. Chemical and Physical laboratories are furnished with ample facilities and scientific equipment for student training and research in these fields.

The Animal Industry Building, a three-story, brick-concrete structure erected in 1917, is occupied by the departments of Animal Husbandry, Poultry Husbandry, Dairy Industry, and Vegetable Crops. The building is well equipped with laboratory and classroom facilities for the study and teaching of dairy manufacturing, animal and poultry nutrition, breeding and wool technology. A modern cheese, butter and ice cream manufacturing plant occupies part of the building, which is used for practical training in dairy products manufacturing. Facilities for teaching and research in animal nutrition have recently been expanded.

The Plant Industry Building is a brick-concrete structure of four stories, erected in 1917. It is modern in design and arrangement, and houses the departments of Agronomy, Bacteriology and Public Health, Botany and Plant Pathology. Housed in this building, also, is the large Intermountain Herbarium, located on the fourth floor. All the departments are provided with well-lighted classrooms and laboratories.

The Engineering Building, a modern, four-story, brick-concrete structure, also erected in 1917, was well planned for its special purpose—training in engineering work. The School of Engineering and Technology has its headquarters here. In this building, all the college work in Civil Engineering, including Surveying, Mechanical Drawing, Hydraulics, Irrigation and Drainage, Municipal and Agricultural Engineering, is taught. This building houses the Hydraulics, Irrigation, Soil Mechanics, and Agricultural Engineering Laboratories, all of which are modern and well-equipped. The Drafting rooms and the Design Laboratories are also housed in this building.

The Mechanic Arts Building, housing shops of the School of Engineering and Technology, located south of the Main Building, is another of the older buildings. To keep pace with rapidly expanding demands for training in automotive, radio aeronautical mechanics, the building has been extensively remodeled and additional floor space provided. It now houses shops and laboratories for the work in the technology of Forging, Industrial Education, Radio and Machine Practice, Electronics, Sheet Metal, Welding, Woodwork and Building Construction. Laboratories, classrooms, shops, radio and sound recording rooms used in these several fields, are adequately equipped to give complete training to students wanting to prepare themselves for the skilled technical trades and for service as technicians in industry. Much new equipment has been added to the shops during the past five years.

The Library Building constructed in 1930, academic and cultural center of the College, is located on the east side of the quadrangle. Space is provided for a Children's Library in connection with a beautifully designed special reading room for under-college age groups. The departments of English and History use the top floor for their classes because of convenient access to library stacks.

The Forestry Building, located on the northwest corner of the campus, is another of the older buildings. A four-story, brick structure, in the olden days it was originally a girls' dormitory, and later the home of the School of Home Economics. Rearranged when the Commons and Home Economics Building was

completed, it houses the School of Forestry. Thorough and technical training in the departments of Forest, Range and Wildlife Management is provided. Its classrooms, laboratories and specimen museums are provided with equipment and all facilities for complete training in these important fields of national resources. In connection with the Forestry School, the College conducts a forestry Summer School at its own camp, located in Logan Canyon about 20 miles northeast from the College.

A Child Development laboratory is located on the east side of the campus. In connection, outdoor space well supplied with playground equipment is available. The School of Home Economics has a Practice House of excellent appearance and facilities just west of the campus.

Lund Hall, a fire-proof, air-conditioned dormitory located south and east of the Library, provides modern accommodations for 200 freshman women. Life in the Hall generally is both comfortable and pleasant. Bed linen is provided and laundered by the College.

Kerr Hall, converted from a large residence, houses 46 upper-class women in home-like style. Bed linen is provided and laundered by the College.

Anticipating a permanent Union Building, students began in 1946 to enjoy the recreational facilities of a temporary Union Building east of the Library. A structure formerly used for military training was converted for this use.

College greenhouses comprise eight complete units which cover 15,875 square feet of planting space. Head houses in connection furnish room for laboratory, storage, and sorting needed for student training and research in plant breeding and propagation in horticulture, floriculture, vegetables, grains and grasses. During the past year a new greenhouse was constructed for virus disease studies.

The College barns are suitable for the care of cattle, horses, sheep and swine with ample storage for feeds. In the College-owned herds are various pure-breeds of livestock common to the intermountain region. An experimental Holstein herd is maintained and operated by the College and Experiment Station on a modern dairy farm located at North Logan, one mile north of the campus. All livestock owned by the College is maintained largely on College-owned property which adds greatly to the facilities of training students in livestock feeding, breeding, care and management practices.

A Stock Judging Pavilion makes it possible to do stock judging under comfortable conditions at all seasons.

The Poultry Plant, built on the colony plan, is equipped for class and experimental research work in poultry husbandry. Among the College flocks are all the important breeds of domestic fowls. The plant is equipped and extensively used for study and research on the best methods of feeding, housing, and disease control in poultry to obtain the most economical production.

The Veterinary Science Building, a one-story brick-concrete structure, has office space, a well equipped dispensary, operating rooms, stalls for animals, and modern equipment for training and scientific work in Veterinary Science and Medicine. A veterinary clinic is periodically conducted. The building is equipped for research and clinical work in Veterinary Science and animal diseases.

An extensive Technology Building with shops and facilities for Aeronautics, Automotive and other technical training was completed in 1948. In 1949 a well-equipped Maintenance building was completed to house the buildings and grounds department.

The main College heating plant is located in a central boiler house. Heat is supplied to the buildings by means of steam through distribution lines in tunnels. Extensive enlargements and improvements completed in 1949 greatly increased the capacity of the plant.

Laboratories

The College laboratories for Animal Breeding, Animal Nutrition, Bacteriology, Botany, Chemistry, Engineering and Technology, Entomology, Farm Crops, Geology, Home Economics, Mineralogy, Physics, Physiology, Plant Pathology, Soil Physics, Wool and Zoology are provided with satisfactory working conditions. The equipment is generally complete, and extensive experimental

research is carried on by the faculty and advanced students in many scientific fields. Recent acquisitions of importance include an electron microscope, a spectrograph, and an ultra centrifuge.

College Libraries

The Libraries of the College consist of the main Library and five branches. The Moore Library, one of the oldest of the branch libraries, is housed in the main library building. It is devoted primarily to children's literature and primary and secondary educational material. Here, also, is kept the Carnegie music collection which has been supplemented by the College and now contains some 4,000 records. The Home Economics Library is housed in the Home Economics building and is specific to the School of Home Economics. The Hatch Memorial Collection, which contains a number of rare books on architecture and interior design, is shelved here. The Engineering Library, housed in the Engineering Building, includes all of the books, magazines, documents, specific to the fields of civil engineering, mechanical engineering, agricultural engineering, and the various phases of technology. The Commerce Library, which is in the Main Building in the School of Commerce, includes books, magazines, and documents specific to the departments of business administration, commerce, secretarial science, and related fields. The Forestry Library, in the Forestry Building, contains books relating to forest, range, and wildlife management.

The Claypool Map Collection is maintained in connection with the Geology Department.

All of the material in all of the branch libraries is recorded in the master catalogue and indexes of the main Library, making all material accessible to research workers on the campus. Utah State is a depository for the Superintendent of Documents. All documents coming from the Federal Government are classified, cataloged, shelved, and made available to the public. The College is a complete depository for all government documents. The libraries receive by subscription and gift approximately 1,300 current journals and newspapers. The book collection numbers 140,000 representing practically every field of learning.

The Library is open to students, faculty, and residents of the State of Utah, practically every day in the year except legal holidays. The books may be borrowed directly from the library or, upon request, by mail.

Herbarium

The Intermountain Herbarium was established in 1932 by action of the Board of Trustees. The function is largely to serve as the repository of plant materials obtained by field exploration, gifts, and exchanges with other institutions; materials that constitute the basis upon which the rich native vegetation of Utah and the Intermountain Region is receiving scientific, economic, and popular investigation and descriptive treatment. From time to time the results of the herbarium researches are released as technical articles published in scientific journals of economic and popular bulletins and circulars released by the Utah Agricultural Experiment Station.

Most of the species that grow in Utah and the Intermountain Region are represented in the herbarium.

The herbarium is likewise the depository of a branch of the College Library, consisting of literature dealing with floristic botany and descriptive taxonomy.

Graduate work in plant taxonomy offered by the Department of Botany utilizes the adequate facilities of the herbarium. These graduate studies may entail thesis researches of a phyto-graphic, revisionary, or floristic nature.

The herbarium facilities are available, by arrangement with the curator, for consultation and research by qualified members of the College Staff, students, collaborating agencies, institutions and members of the community.

Identification of and information concerning native or introduced plants will be provided by the herbarium staff. Requests for information or plant identification should be addressed to the Curator of the Herbarium.

Student Organizations

Government and Traditions of the Student Body Organization

THE Associated Students of Utah State Agricultural College is an organization which embraces all students of the Institution. Its prime object is to foster a proper spirit of college loyalty, and to give the students practice in managing public affairs. It also secures efficiency, as well as uniformity, in administration of matters pertaining to the entire student body, and encourages all students to participate in college activities. A point system of awards to recognize participation in all non-athletic activities encourages high scholarship during participation by means of graduated bonuses for higher scholarship. The organization provides each member with proper athletic, theatrical, and social recreation at low cost. This organization cooperates with faculty representatives. Students may participate in the following activities:

1. a. Athletics for men. b. Athletics for women.

An intramural program, including all seasonal sports for which awards are given, is conducted.

2. Musicals, including all public performances of the band, the orchestra, and musical clubs. These organizations present several concerts during the year and each group usually tours some part of the surrounding area.

3. Theatricals. There is great activity in the field of the drama, and numerous productions are staged each year by student groups. Students participate in the lighting, staging, directing, and managing, as well as the acting. The performances of recent years have been of high quality.

4. Opera. Each year the Music Department produces an opera. With successful performances of such works as Rigoletto, Faust, Aida, Il Trovatore, Carmen, Student Prince, and Blossom Time, the annual production of an opera or operetta has become traditional.

5. Debating and Public Speaking. Debating is extremely popular, drawing approximately 30 participants each year. The College is a member of the Rocky Mountain Forensic League and each fall meets schools of this group in discussion. Participation in the Utah-Idaho Junior College Forensic League and in debate tournaments on the Pacific Coast provides ample opportunity for experience in tournament debating. Intrastate debates are held in the form of a state legislature.

6. Student Publications. The students publish a weekly paper, "Student Life," a yearbook, "The Buzzer," and a quarterly magazine, "Scribble," which are distributed to all regularly registered students. Some campus organizations sponsor publications of their own such as the Forestry Club's "Juniper."

7. Lyceum Course. The Lyceum presents numerous national and international figures. During 1949 the Lyceum, in conjunction with Civic Music, presented 15 outstanding lectures and musicians.

8. Dances and Entertainments. At regular intervals, the Student Body organization sponsors all-college dancing parties, informal and formal in nature, and regular assemblies which provide extensive expression for student talent. Students with talent and interest in such participation should register with the Student Public Service Bureau.

Organizations

More than one hundred clubs, societies, and professional organization exist on the campus. There are also seven chapters of national fraternities and five chapters of national sororities. All are officered by students.

Foreign Students

Since the war the number of students from foreign lands has increased. Special adjustments have been made to help meet their needs in English and

Speech work and other activities. The Cosmopolitan club for both foreign and American students is active.

In 1949 the following countries were represented at USAC: Belgium, Burma, Canada, Chile, China, Colombia, Egypt, Honduras, Iceland, India, Iran, Iraq, Lebanon, Mexico, Palestine, Peru, Puerto Rico, Syria, Trans-Jordan, and West Africa.

Assemblies

A general assembly is conducted each week in the main auditorium. A joint student-faculty committee plans the assemblies, which consist of lectures, debates, dramatic presentations, concerts, and activities selected for the enlightenment, cultural development, and entertainment of the students. The 11 a.m. hour Tuesdays has been set aside for general assemblies.

U. S. A. C. ALUMNI ASSOCIATION

W. W. Gardner, President

D. A. Skeen, Past President

Leonard W. McDonald, Executive Secretary and Treasurer
Director, Division of College Development and Alumni Relations.

The Utah State Agricultural College Alumni Association was organized on June 13 and 14, 1899, by Alumni who met on the campus and formed the Association. At that time there were 44 members. The Association has shown consistent and rapid growth until it numbers more than 9,500 graduates and approximately 51,000 former students who did not obtain degrees.

The graduates of Utah State Agricultural College have achieved outstanding prominence in every walk of life and every state in the nation. Aggie alumni in large numbers served in the late war, and an exceptionally large number of these men and women held or are holding high commissions in the military and naval forces.

Purpose. It is the purpose of the Association, (1) to form and strengthen friendships among the Alumni; (2) to foster feelings of gratitude and love for the College; (3) to establish beneficial relationships between the Alumni and the College; (4) to promote the interests and welfare of the College and its Alumni; (5) to represent the interests of the Alumni in the welfare, standards, and advancements of the College; and (6) to serve as a representative of graduating classes after they have left the Campus.

Membership. Any person who has attended Utah State Agricultural College one quarter or more may obtain membership in the Alumni Association by making application to the Alumni Executive Committee. All persons receiving degrees, diplomas or terminal vocational certificates from the College automatically become members. Sustaining membership in the Association may be had by parents of graduates or students or by others who have shown an interest in the College or the Association, upon the payment of annual dues of five dollars. Persons not eligible for regular membership in the Association, but who have done some outstanding service to the Institution are eligible for honorary membership, and may become honorary members upon recommendation of the Executive Committee, and upon being accepted by the Alumni Council.

Dues. Annual dues are \$2.00 per year and joint annual dues (husband and wife) are \$2.50 per year. Life membership may be obtained singly at \$25.00 or \$35.00 for a joint membership.

Government. The governing power of the Association is vested in the Alumni Council composed of fifteen elected members, and ex officio members. From this group, a president and four executive members are chosen. The president and the executive committee select the Executive Secretary and Treasurer of the Association when that position is declared vacant. The Alumni Executive Sec-

retary is the official representative of the Association on the Campus. Senate Bill 90, passed by the 26th session of the legislature and signed by the Governor March 15, 1945, makes the president of the Alumni Association an ex-officio member of the Board of Trustees of the College.

Function. Besides maintaining a complete record of each alumnus after graduation, two special projects have been originated and sponsored by the Alumni Association—the Library Endowment Trust Fund and the Life Membership Fund. Earnings from the former fund, accumulated from popular subscriptions, are given to the College Library to aid it in the purchase of books which ordinarily could not be bought from the regular library budget.

The principal from the Life Membership Fund has in the past been loaned to worthy students to aid them in finishing their college work. Interest from the loans is used to support the Alumni Association.

The Association serves as a parent organization for several active chapters in Utah which each year sponsors dinner meetings and parties for alumni and former Aggie students in their respective areas.

Since September, 1925, the Alumni Association has published the Utah State Alumni Quarterly, a magazine appearing four times each year and devoted to keeping Alumni members informed of each other's doings, and to maintaining a strong relationship between the Alumni and College. In March, 1949, this publication was replaced by the Utah State Alumnus which is issued nine times a year.

The Board of Trustees of the College have by formal action created the Division of "College Development and Alumni Relations" which the Alumni Secretary heads. It is anticipated that the establishment of this division of the College will open up avenues of service and support for the College by its Alumni members.

"A" MEN'S ATHLETIC ASSOCIATION

Conley Watts, President

Glen Worthington, Secretary-Treasurer

The purpose of this organization is to foster a sound and healthy spirit of cooperation between the former letter-winning athletes of Utah State Agricultural College and the College, and to promote the spirit of good fellowship among the former letter-winning to the end that athletics at Utah State shall be conducted on a high plane, ethically and otherwise.

The "A" Men's organization provides a means whereby aid and assistance may be rendered the College in building and maintaining a sound athletic program. In the past, the organization has each year awarded a scholarship in an amount equal to the resident tuition to a deserving athlete, either resident or non-resident of the state. Other scholarships are gradually being made available through the work of the "A" Men's group.

PROFESSIONAL RELATIONS AND FACULTY WELFARE COMMITTEE

The Professional Relations and Faculty Welfare committee has been authorized by the Board of Trustees and the Administration and elected by the Faculty to represent the Faculty on matters pertaining to professional relationships and welfare. A principal duty of the Committee is to cooperate with the Administration in the development of standards, policies, and programs on Faculty professional relations and welfare, leading to better understanding and improving the relationships among the Faculty, Administration, students and other groups.

Academic Regulations

For purposes of administration, the College is divided into the following major divisions: (1) the Academic, which is administered through seven schools; (2) the Graduate School; (3) the Research, administered through two Experiment Stations; (4) the Extension Service, including the Correspondence and Extension Class Work; (5) the Summer Session; and (6) the Branch Agricultural College at Cedar City. The academic regulations apply to all instructional work of regular session, summer session, correspondence and extension study.

Admission

Prospective students are urged to send official transcript of their credits to the Registrar at least four weeks before the opening of school.

ENTRANCE with college standing is based upon (a) graduation from an accredited high school or (b) upon presentation of fifteen approved high school units of work or (c) by examination of those students eighteen years of age or older who have had other training.

Students who have not been graduated from high school and who are presenting fifteen approved units for entrance may include one unit of credit for military science or one unit of physical education, but not more than one unit in combination.

Entrance by examination is based upon two types of tests developed by the U. S. Armed Forces Institute or other comparable tests approved and recommended by the American Council on Education. **First**, the tests of general educational development which are designed to measure the extent to which all of the educational experiences of the applicant for admission have contributed to his ability to "carry on" in a program of general education, or to his educational development of the type which might otherwise have resulted from attendance in a regular academic high school. **Second**, Subject Examinations: Each of these subject examinations may be used to determine whether the achievement of the applicant for admission is the equivalent of that expected of regular high school students for satisfactory completion of a corresponding course of classroom instruction.

Students who do not otherwise meet the entrance requirements will be required to take the General Achievement Test. A student who fails this test because of extenuating circumstances prevailing at the moment may, upon recommendation of the Examiner, be admitted conditionally and permitted to take an alternative test sometime during the first quarter and thereby establish college standing as of date of original entry.

No credits obtained prior to the time at which college standing was established can be used toward a degree, except that where the amount of high school deficiency is so small that it requires but part of the student's time to carry courses to remove high school deficiencies, the remainder of the student's time may be spent on college courses and the credit so earned may be accepted to satisfy degree requirements. Students under eighteen years of age may not enter with a high school deficiency.

The following suggestions are designed to emphasize the desirability of including various studies in the high school program of the student who plans to enter college.

1. English. Since the ability to write clearly and to read with understanding and appreciation is essential, it is highly desirable that the student complete three or four units in English.

2. Mathematics. Not only as a tool to further learning, but as a means of providing basic education, mathematics has much to offer. Two years of such study would be profitable. Students planning to specialize in the sciences or in engineering should complete two or more units in mathematics in high school.

3. Social Studies. Social studies—such as history, civics, government, economics, sociology and geography—are basic to the understanding and solution of contemporary problems in the community, in the nation, and in the world. From two to four units may well be devoted to this area by the prospective college student.

4. The Sciences. This field is rich in possibilities for understanding the modern world. Two units in science might well be completed. For those who plan to emphasize science or engineering in college, three units are helpful.

5. Foreign Languages. The prospective college student might well develop a basic reading or speaking knowledge of a modern foreign language. Some background in one of the classical languages would also be desirable.

6. Fine Arts. This field offers opportunity for development in an area of general education which can contribute much toward individual growth.

7. Other Subjects. None of the foregoing statements should be interpreted as meaning that other subjects—agriculture, commercial subjects, home economics, industrial arts, speech, etc.—should be avoided by the student who is planning to attend college. Such subjects, when properly studied, contribute materially to the educational growth of the individual and prepare him for continued study as well as for the more general activities of living.

Students who expect to become candidates for any degree or diploma from any of the schools of the College must include among the units presented those preparatory courses specified as prerequisite to beginning college courses in the various fields. Such students are urged to give serious thought to the selection of a major field of interest. Each student in cooperation with his parents, high school principal or other high school adviser should plan the high school program of studies so as to meet the requirements for admission to his chosen field of interest. Students who fail to do this may expect to be delayed in starting their college work until the prerequisite courses are made up. Not all of the schools and departments of the College have specified prerequisites, but those who do have, list them in their school and departmental section in the College catalog. This information should be used in planning the high school course.

Transfers from Other Colleges. (Advanced Standing): The College does not grant collegiate credit for excess high school work. Advanced standing for work of satisfactory grade done in some other accredited college, after the completion of 15 units of high school work, may be granted by the Committee on Advanced Standing, provided the student presents satisfactory evidence that the work offered is equivalent to the work for which he wishes to substitute it.

Advanced standing credits, when evaluated, are accepted on a provisional basis only, and will not be included on a transcript of college credits until after the requirements for the degree toward which the credits are to be applied have been completed. Transcripts submitted for evaluation become the property of the Institution, and will not be returned. Transcripts should be sent to the Registrar four weeks in advance of registration. It is necessary to have them at the time of registration, in order to arrange the course of study properly.

Provisions for Education of Veterans. Utah State Agricultural College has a broad and diverse curriculum. This makes possible the training of ex-service men and women for many occupations and at the same time provides ample opportunity for general education.

The College has made special provision for entrance, vocational advisement, acceleration, and curriculum adjustments for these men and women.

It is possible, on the basis of evidence of educational growth since leaving high school and by the demonstration of aptitude for college work on tests for this purpose, for students to enter the College without completing all high school requirements.

Registration and Credits

Quarter Credits (Definition): A quarter hour credit is the credit given for one hour of lecture or three hours of laboratory work each week for 12 weeks. Hereafter, for brevity, this unit will be known as a "credit."

Class Standing: Forty-eight credits of approved college work in addition to the prescribed entrance requirements, are required for Sophomore rank; 96 credits for Junior rank; and 136 credits for Senior rank. The foregoing figures include the required credits in Physical Education or Military Science.

Registration Dates: For the Fall Quarter students will register on Thursday, Friday and Saturday, September 28, 29 and 30. Classes will begin Monday, October 2.

For the Winter Quarter, all students will register on Wednesday, January 3. Classes will begin Thursday, January 4.

Registration for the Spring Quarter will take place on Monday, March 19. Classes will begin Tuesday, March 20.

On each registration day, students will be permitted to register according to an alphabetical schedule to be announced later.

Late Registration: Registrations after the last date given above for each quarter are considered late. A fee of one dollar per day is charged for those who register late, with a maximum fee of five dollars. In case the registration cannot be completed by the prescribed day, owing to some delay caused by the College or its officers, an exemption may be obtained upon application to the Registrar on the regular day of registration. The amount of work for which any student is allowed to register is reduced by one and one-half credits for each week or fraction thereof that a student is late in registering.

All classes are conducted as scheduled up to 5 p.m. on the day preceding a holiday. Likewise all classes are conducted as scheduled the day following a holiday.

Normal Registration: Fifteen credits, exclusive of one credit of Military Science or required Physical Education, is the normal registration for any one quarter.

The registration is construed to include any Extension, Correspondence, Institute, or other work carried by the student for credit or for removal of high school deficiencies during the period of the school year in question.

No student will receive credit for residence work not included on his registration card, which must be filed in the Registrar's Office before the end of the quarter. Students who wish to attend regularly any class for which they are not registered must obtain a visitor's permit from the Registrar's Office. No credit is allowed for such attendance.

All male students are required to take six quarters of basic military science and tactics, unless exempted because of previous military service, physical disability, or other sufficient reason. This work is taken in the Freshman and Sophomore years.

Withdrawal from Classes: The program of courses listed on the student's registration card, approved by his dean and filed in the Registrar's Office is considered as the student's official registration for the quarter. A student is held responsible for the satisfactory completion of the entire program. Unless an official "Change of Registration" form is filed with the Registrar's Office, before the end of the quarter, F grades will be recorded in case of failure to obtain passing grades in any of the courses for which the student has registered, regardless of the reason for the failure. During the first seven weeks of any academic quarter, a student may withdraw from a class on his own initiative with the consent of the instructor and his dean.

After the beginning of the eighth week of any academic quarter, withdrawal from a class is permitted only with the approval of the Attendance and Scholarship Committee. A petition initiated by the student shall be taken by him to his adviser, who will obtain the comments of the class instructor and of the

dean. The adviser will forward the petition, together with a summary of the facts gleaned from the student, the dean, and the instructor, to the committee. The student may be requested to appear before the committee.

Incomplete Work: Students must complete by the end of the quarter all courses for which they have registered. Incomplete grades can be granted by an instructor only when permission is granted by the Attendance and Scholarship Committee before the close of the quarter. Necessary petition forms may be obtained at the Registrar's Office.

Incomplete work must be finished, and a passing grade given in the course, within one year of the close of the quarter, otherwise the credit is forfeited.

Credit by Examination: In special cases, students may be permitted to obtain college credit by passing examinations in subjects not taken in course. Credit for a subject taken in course for which a grade other than passing has been received cannot be acquired by means of special examination. This privilege does not contemplate the combination of "visiting" or "auditing" a class with a request for a special examination as a means of acquiring credit. Neither does it contemplate outside assignments or outlines on the part of the instructor being combined with an examination to acquire credit. This privilege is intended to measure information and training gained from practical experience that may be considered the equivalent of the experience and training received by students in an organized course given in the college.

A maximum of 18 quarter hours' credit can be acquired by special examination. None of the last 30 credits presented for a B.S. degree may be obtained in this manner. Unless the examination is taken prior to the close of the second week of any quarter for which a student enrolls, the credits gained will be included as part of the student's load for the quarter.

Credits earned by special examination are accepted on a provisional basis only, and will not be included on a transcript of college credits until after the requirements for the B.S. degree toward which the credits are to be applied have been completed. Credits earned by special examination cannot be used for the purpose of satisfying the requirements for the Masters degree nor for certification.

Request for permission to take special examinations should be made to the Committee on Special Examination on forms to be obtained at the Registrar's Office.

A student may earn as much credit in the two-week Christmas holiday period as in a similar period in residence, without having it added to his load the preceding or following quarter.

Residence credit shall not be given for off-campus study without special permission of the Deans' Council.

Low Scholarship and Probation. Students who have not maintained an average grade of C or better and students failing to obtain passing grades in 12 or more credits during the preceding quarter are automatically placed in the low scholarship group. No person in the low scholarship group shall be eligible to be elected, appointed, or to hold office in the student body organization.

Students in the low scholarship group are on probation for poor scholarship.

Students on probation who violate the terms of their probation are subject to immediate suspension from the college.

When in doubt regarding any of the regulations affecting them, students on probation should consult with the Attendance and Scholarship Committee. This Committee, alone, has the authority to waive or modify the terms of probation.

Students in the low scholarship group may not register for more than 15 credits per quarter, exclusive of one hour of Physical Education or Military Science.

Numbering of Courses. The collegiate work of the Institution is divided into three divisions: Lower Division, Upper Division and Graduate. Courses numbered from 1 to 99, inclusive, are Lower Division courses. Those listed from 100 to 199, inclusive, are Upper Division courses. All courses with number 200 or over are graduate courses.

Qualified students may enter courses in any quarter, unless a statement to the contrary appears in the description of the courses.

Lower Division students will not be allowed to enter Upper Division courses except upon approval to the Dean of Adviser and the instructor of the course.

LOWER DIVISION

THE Lower Division comprises the work of the Freshman and Sophomore years. The main purposes of this division are to provide a broad and integrated background in the principal fields of human knowledge, and to prepare students for the major work upon which they will concentrate in the Upper Division.

Provisions are made in several departments of the College for the issuance of Certificates of Completion for two years of work as prescribed by such departments.

Students who expect to become candidates for the Bachelor's degree should plan their courses with great care through consultation with their faculty advisers, major professors, and deans, to insure the best choice of courses for filling the groups and to provide the proper foundation for their advanced work. Failure to do this may necessitate an extra year to complete the work for the desired degree.

Students should satisfy the following requirements, in order to complete the work of the Lower Division:

1. Remove any deficiencies that may exist in the entrance requirements.
2. Complete 96 credits, or quarter hours of work, (including Military Science and Physical Education) with an average of 75% or higher.
3. Prepare a foundation of at least 15 credits for the field of specialized study in the Upper Division.
4. Satisfy the (A) English, (B) Group, (C) Military Science and Physical Education requirements as follows:

A. English Composition.

1. A special placement examination in English is required of all freshmen.

2. Freshman students in the School of Engineering and Technology and in the School of Forest, Range, and Wildlife Management are required to complete English 17, 18, and 19. Students who start this series should continue throughout the three quarters, even if they transfer from Engineering or Forestry to other schools.

3. All other students are required to complete English 10 or 11 in the sophomore year.

Note: For graduation all students must present nine credits in English Composition (See Paragraph 6 under "Summary of Requirements for Graduation.")

GROUP REQUIREMENTS

- B. Groups:** A total of 40 credits must be selected from the following four groups with not less than eight credits nor more than 12 credits being counted in any one group.

1. **Biological Science.** This group requirement may be satisfied by taking any one of the following combinations of courses:

A. Botany 1 or Zoology 1, and any lower division Bacteriology course, or Physiology 4.

B. When more technical courses are required they may be used to satisfy this group requirement if taken in any of the following sequences:

1. Botany 24, 25.

2. Zoology 3, 4.

3. Zoology 2 and Botany 25, or any lower division Bacteriology course.

Students who already have a satisfactory knowledge of general biology, as demonstrated by examination, may satisfy this group requirement by taking Physiology 4 and any lower division Bacteriology course.

2. Exact Science.

Chemistry—any course of Lower Division grade.

Geology—any course of Lower Division grade.

Mathematics—any course of Lower Division grade.

Physics—any course of Lower Division grade.

(Physical Science 31 and 32 are recommended. These courses are built around principles central to all the Physical Sciences.)

3. Language and Arts.

Art 1, 2, 3, 4, 22, 26, 32, 33, 36.

English—any literature course of Lower Division grade.

Landscape Architecture 3.

Language—any beginning course in French, German, Portuguese, Spanish or Latin.

Music 1, 4, 5, 80, 81.

Speech—any course of Lower Division grade.

4. Social Science

Agricultural Economics 53.

Economics 51, 52.

History—any course of Lower Division grade.

Psychology 53.

Political Science 1, 10, 70.

Sociology 10, 70.

Majors in departments in the School of Arts and Sciences should see the introduction to the Arts and Sciences section of this catalog for suggested courses with which to fill group requirements.

C. Physical Education: Six quarters of work in Physical Education activity classes are required of all women students, and also of all men students who do not take the required courses in Military Science (see Military Science and Tactics).

In departments where there is a prescribed course of study such as in Forestry; Smith-Hughes Teacher Training courses; and in Engineering and Technology, the completion of such courses shall substitute for the group requirements, provided the student remains in that field.

UPPER DIVISION

NINETY-SIX credits (quarter hours of credit) with an average grade of 75% or higher are required for admission to the Upper Division. Graduates of standard normal schools and junior colleges, and students from other colleges who present at least 90 credits of acceptable college work, in addition to the courses in Physical Education or Military Science required at the institution from which they are transferring, may be registered in the Upper Division.

The completion of the group requirements in any accredited collegiate institution will substitute for the completion of the group requirements at this institution, as prescribed in the section of the Lower Division. This does not apply to students who have been pursuing prescribed courses which do not include the group requirements. Students who change from a prescribed course to a major under the group elective system must complete the basic group requirements as specified in the section on the Lower Division. Transfer students who continue on in a prescribed course will be held for the completion of the Lower Division courses as prescribed at this institution, except as equivalent courses may be accepted as substitutes for our own courses.

Major Subject: The student should select a major subject upon entering, or early the first year, but in no case later than entrance in the Upper Division. As soon as the major subject has been selected, the student should contact the

head of the department in which he has decided to major. The head of the department will thereafter act as the student's adviser. The student's registration in each succeeding quarter should be carefully checked and approved by this adviser (called the major professor) in order to insure proper selection and sequence of courses for satisfying institutional and departmental requirements.

The Major Department has the authority to prescribe not less than 30, and not more than 50 credits in the major subject (exclusive of any courses which may have been used to satisfy Lower Division requirements in any of the groups). The Major Department and the Dean shall also prescribe such other related courses as may be considered desirable, provided always that the student's free electives may not be reduced below 36 credits.

Special consideration is granted students who pursue prescribed Pre-medical, Pre-dental, Pre-veterinary, Pre-osteopathy, Pre-legal, and Child Development programs for three years at this College. If they pursue further prescribed work in their field for an additional year at an approved institution, they may be granted a Bachelor of Science degree by this College. They need not comply with general major-minor requirements as previously outlined. The requirement that at least one quarter (at least 12 credits) of the Senior year must be done in residence at this Institution is waived for such students.

Students who pursue the Nursing course at the College and the cooperating hospitals need not comply with the formal major-minor requirements if they complete the prescribed program in Nursing.

Minor Subject: The student is permitted to choose his own minor. The minor consists of 18 credits either in one department or in two departments closely related in subject matter, provided that minor in more than one department must have the approval of the Dean and the Major Professor.

Courses used to satisfy the English composition, the basic groups, military science or physical education, and freshman orientation requirements as specified under the Lower Division cannot be counted in the minimum 30 credits for a major or 18 credits for a minor.

Graduation

The College offers Certificates of Completion for two years of applied work in certain departments, the degrees of Bachelor of Science, Master of Science, and Doctor of Philosophy; and gives work to fulfill the requirements for all the professional certificates issued by the State Board of Public Instruction.

IMPORTANT: The College reserves the right to change at any time the requirements for graduation, and every candidate for a certificate, a diploma, or a degree shall be held to compliance with such changes, as far as the uncompleted part of his course is affected.

Students are expected to familiarize themselves with institutional rules and regulations. The responsibility for satisfying the requirements for graduation rests upon the students concerned.

Students who do not graduate in the class with which they entered are held to the requirements, including entrance, of the class with which they graduate.

TERMINAL CERTIFICATE

The Schools of Agriculture, Home Economics, and Engineering and Technology offer two-year courses in practical studies leading to a certificate of completion, for those who are not interested in the regular four-year course leading to the B.S. degree.

In the Schools of Agriculture and Home Economics the courses are arranged so that the student may, at a later date, complete the four-year course with a minimum loss of time. While these short courses are designed to develop a broader understanding of the sciences underlying these fields and to lay the foundations for good citizenship, they offer a considerable range of selection of practical courses in both the Lower and Upper Division.

The general requirements for this Certificate are:

1. Satisfy the entrance requirements.
2. Complete 96 credits, which includes the required work in Physical Education or Military Science.

3. Complete a Major of 30 credits in one or more closely related departments of the School in which the Certificate is granted.

4. Complete a Minor of 15 credits closely related or basic to the Major field. This need not be in the same school.

5. Complete 24 credits in the basic groups, as follows: Language, nine, which shall include English 10; Exact Science, five; Biological Science, five; and Social Science, five.

6. Complete 21 credits of elective work.

Only Lower Division credit may be obtained for work taken during the short course, even though some Upper Division courses be taken.

For additional information, see descriptions of work in the school concerned.

In the School of Engineering and Technology, definite programs of study are prescribed leading to certificates of completion within definite fields of applied industrial work. These curricula may be found in the section entitled "School of Engineering and Technology."

Requirements for the Degree of Bachelor of Science

The College confers the degree of Bachelor of Science in Agriculture; Forest, Range and Wildlife Management; Arts and Sciences; Agricultural Engineering; Civil Engineering; Commerce and Business Administration; Home Economics; Education; Industrial Education, or Technology upon students who meet the requirements specified herewith:

Before a student can become a candidate for a baccalaureate degree, the abstract of his record in College must show: first, that he has satisfied the entrance requirements as prescribed for the class with which he expects to be graduated; second, that the collegiate work for which he has credit, his conditional and other pending credits, the completion of which he is reasonably assured, and the work for which he is registered or is planning to register, together satisfy the requirements for graduation including Physical Education and Military Science as prescribed for his class.

Regular students who are planning to graduate at the next Commencement should consult their major professor and jointly prepare the "Admission to Candidacy" form not later than the fourth week of the Fall Quarter. Students will be admitted to candidacy when the plan of course work presented is found to fulfill all remaining requirements for graduation.

Summary of Requirements for Graduation

For students who will graduate in the spring of 1951, the following requirements must be met after satisfying the requirements for admission. The responsibility for satisfying the requirements for graduation rests upon the student concerned.

1. Six quarters of work in Physical Education for women, provided that candidates officially excused from Physical Education present one credit of other work for each quarter that they have been excused.

2. Six quarters of work in Military Science for men unless officially excused from this requirement. Students are normally required to complete the basic military course of six credits during the Freshman and Sophomore years. Men exempt from Military Science are required to substitute one quarter of Physical Education for each quarter of Military Science from which they are exempt. It exempt from both Military Science and Physical Education, candidates must present one credit of other work for each quarter they have been exempt.

The advanced course consists of the third and fourth year of Military Science. Entrance upon the advanced course is elective, but once entered upon, the course becomes a prerequisite for graduation, unless the student shall be discharged in accordance with the provisions of Army Regulation 145-10.

3. One hundred eighty credits of acceptable collegiate work, exclusive of the required credits in Physical Education or Military Science.

4. Fifty-four credits of Upper Division work taken after the candidate has presented at least 90 college credits, in addition to the required courses in Military Science and/or Physical Education or their substitutes.

5. The completion of a major, a minor, and related work as outlined under Upper Division.

6. The completion of the group requirements and of the English composition requirements, English 110, or its equivalent, as explained under Lower Division requirements.

Paragraphs 5 and 6 above do not apply to students who are pursuing a prescribed course of study such as in Forestry, Smith-Hughes Teacher Training courses, Engineering and Technology.

7. Each school of the College, subject to faculty approval, shall determine the nature and amount of extension credit accepted for admission and toward graduation with a Bachelor's degree. In no case shall more than 50 percent of the credit submitted for graduation be non-residence credit, including special examination, extension and home study credit. This 50 percent may include one-half home study credit.

8. Applicants for degrees having taken courses for credit in the Extension Division are subject to the regular college instruction requirements and must file transcripts of credit with the Registrar's Office.

9. Candidates for a Bachelor's degree must have studied in residence at Utah State Agricultural College during three full quarters, a full quarter being a quarter in which at least 12 residence credits are earned.

The Graduation Committee may accept an equivalent amount of part-time residence credit in fulfillment of this requirement where recommended by the department and school concerned. The committee may waive 12 credits of the residence requirements in cases in which the department, the school, and the committee consider that the purposes of the requirement have been fulfilled otherwise.

10. Four passing grades, "A," "B," "C," and "D" are employed in reporting credit. No credit with grade lower than "D" can count toward satisfying credit requirements. The maximum number of "D" grades counting as credits shall be 36 credits.

Grade points have been assigned to grades as follows: 3 grade points for each credit of "A," 2 for each credit of "B," 1 for each credit of "C," zero for each credit of "D." A deduction of one grade point will be made for each hour of failure. For graduation, a student must have as many grade points as he has credits for which grades of "A," "B," "C," "D," and "F" have been assigned. Credits of "P" grade are disregarded in computing grade point averages.

11. The candidate must file an "Application for Admission to Candidacy" not later than the fourth week of the Fall Quarter preceding graduation. This application must show the course of study to be followed in order to complete all requirements for graduation, and must be approved by: (a) the professor in charge of the major subject; (b) the dean of the school in which the major work is done.

12. The candidate must file an "Application for Graduation" with the Graduation Committee not later than the first day of the winter quarter, containing information requested. Any candidate who fails to file his application for graduation by the first day of the winter quarter, may be held over to the next year's commencement.

13. The candidates must be of good moral character and must have discharged all college fees.

14. Attendance in person at the Commencement and Baccalaureate exercises at which the candidate expects to secure the degree is mandatory, unless excused in writing by the Graduation Committee for very urgent reasons upon petition from the students.

Requirements for High School Teacher's Certificate

Students graduating with majors in Elementary and Secondary Education must meet the requirements for a Utah State Teacher's Certificate. Majors in other departments may also earn a certificate by meeting the requirements for one of the various certificates granted by the State Department of Public Instruction. For details of the requirements for the various teaching certificates see School of Education Department.

GRADUATE SCHOOL

J. Stewart Williams, Dean

Objectives and Organization

THE Graduate School is organized to serve the Educational needs of men and women who have completed their undergraduate work and who desire to qualify themselves further for professional services, or who may wish to identify themselves with a program of higher education leading to a teaching or research career on the college or university level. In all advanced work, effort is made to bring the student into direct contact with the basic research and teaching activities in his chosen field to the end that he may obtain a comprehensive view of a specialized field of knowledge together with the training essential for effective teaching or independent investigation. In graduate work the aim is to achieve a high standard of scholarship rather than to fulfill routine course requirements.

Departments that offer graduate work in related fields or in natural educational areas cooperate (1) to determine the needs for graduate work or training within the areas; (2) to provide fundamental and basic course work or training within the areas; (3) to foster the spirit of scholarship and research and to determine standards of achievement appropriate for the areas involved; and (4) to promote institutional standards and give institutional character to graduate work beyond that which is made possible by independent departmental direction.

Graduate work in the College is directed by a Graduate Council, which consists of the Dean of the Graduate School and seven members of the faculty appointed by the President. The scope of the Graduate school covers all graduate study in the College.

Admission to Graduate School

A graduate with a Bachelor's degree from Utah State Agricultural College or from any other accredited college or university may be admitted to the Graduate School. Seniors in the College who have an average of a "B" or better in all their courses in their junior and senior years and who at the beginning of any quarter lack not more than five quarter credits to complete all requirements for the Bachelor's degree, may be allowed to register for a limited amount of graduate work. All such courses selected for graduate credit must be approved in advance by the Head of the Department and by the Dean of the Graduate School. Graduate credit will not be allowed if the student's total credit for which he is registered during the quarter exceeds 16 hours.

Students are admitted to graduate studies in social work who have taken a Bachelor's Degree with: (1) a major in social work; (2) a major in sociology, economics, political science or psychology, and have a total of not less than 36 credits in these four departments; or (3) a major in child development, physical education, public health or education, and who also have 25 credits in one of the four social sciences above listed with a fair balance among them. Students over 35 years of age are admitted only by special arrangement.

Admission to the Graduate School does not imply admission to candidacy for an advanced degree. Such admission is granted by the Dean of the Graduate school only on a recommendation of the Head of the Department and of a special examining and advisory committee as explained below. All students registering in the Graduate School must have their registration card signed by the Dean of the Graduate School. Students who wish to register in the Graduate School should submit their application at least one month before the opening of the quarter in which they plan to matriculate. In all cases, students who are not graduates from the Utah State Agricultural College must provide a certificate of graduation and a transcript of credit taken in other institutions. If this transcript of credit does not accompany the application, a date should be specified at which transcript will be provided. Blanks for making application can be had from the Registrar's office or from the office of the Graduate School.

MASTER'S DEGREE

All approved graduate courses in the College lead to the Master of Science Degree. Majors for the Master of Science degree are offered in all the basic biological, physical, and social sciences, and in the various educational, industrial, and professional divisions of the college. The specific departments, or groups of departments (over 30 in all) in which the Master of Science degree is given, together with the course service provided by the departments, may be determined by consulting the departmental statements provided in the catalog under the various undergraduate schools of the College.

Requirements and Procedures for Obtaining A Master of Science Degree

1. Acceptance for Registration as a Candidate for a master of Science Degree. A student who has been registered in the Graduate School for one quarter, and who has satisfied the Department in which he proposes to do his graduate work, may be admitted to candidacy for a Master of Science degree upon the recommendations of the appropriate area committee or of the Head of his Department and of a special examining and advisory committee appointed by the Dean of the Graduate School. All students wishing to become candidates for a Master of Science degree will apply directly to the Graduate Dean. Application blanks are available at the Office of the Dean.

2. Major Professor and Thesis Director. The applicant will be assigned by the Dean of the Graduate School to a major professor, who in all cases will be a member of the teaching staff of the Department in which the student has chosen to do his major work, and who will be chosen in consultation with the student and the Head of the Department involved. The Major Professor will advise the student in the planning and in the prosecution of his course of study and in his research work, and will function as chairman of the student's Advisory and Examining Committee. The Major professor will be aided by an Examining and Advisory Committee consisting of himself as chairman and at least three other members chosen from the faculty of the Major Department or closely related Departments. A fifth member, completing the committee personnel, may be chosen from the faculty of the English Department. The committee is responsible for all examinations dealing with the candidate's work.

In instances where the thesis chosen by the applicant is based on research best directed by personnel in another department or supported by the Experiment Station or by Federal or outside agencies, the applicant, with the advice of the Major Professor and the Head of the Department, may be assigned a special Thesis Director. This Thesis Director need not be a member of the teaching staff or of the Major Department in which the student is majoring. The Thesis Director will become a member of the student's committee, directly responsible for the student's research and thesis, and will function in this connection with the Major Professor in directing the student's educational program. The Dean of the Graduate School and the Head of the Department in which the student is specializing are ex-officio members of all committees and advisory groups.

3. Qualifying Examinations and General Requirements. By study of the records of the student's scholastic work, by use of available departmental examination and by special examination, both oral and written, the advisory and examining committee shall satisfy itself as to the adequacy of the student's preparation and advisability of his pursuing graduate work.

No student is admitted to candidacy who has not received an average of "B" grade in his junior and senior years of undergraduate studies and who has not completed at least one quarter's work in residence with an average of "B" or better. Exceptions may be made where it is shown by the Department that the student has special aptitudes not adequately indicated by his scholastic record.

4. Program of Study. If the Advisory Committee is convinced that the preparation and ability of the applicant are such as to give reasonable assurance of success in advanced studies, then the committee under the direction of the Major Professor shall, with the applicant, plan a program of study which will

meet all requirements for the Master of Science degree. This program must include:

- (a) At least three quarters of residence. Where courses are critically chosen, four summer sessions with residence research culminating in a thesis may be accepted as fulfilling residence requirements. Under no condition will extension credit or credit transferred from other institutions be permitted to shorten the period of residence.
- (b) At least 45 credits including the thesis in courses numbered 100 or over approved for graduation in addition to any lower or upper division courses which may be necessary to strengthen the undergraduate preparation in his major and minor subject. Under no condition will more than 16 credits be allowed for any one quarter with 12 credits as a maximum for **one-half time**. All courses allowed toward a Master of Science degree must be completed with a grade of "B" or better.
- (c) At least ten credits exclusive of work connected with the thesis in courses numbered 200 or above.
- (d) A thesis with 9 to 15 credits. All courses allowed toward graduation shall be in the major department or closely related fields and must be completed with a grade of "B" or above. Under no condition will more than 16 credits be allowed in any one quarter with 12 hours as a maximum for students on a one-half time basis.

Any modification of these requirements necessitating action of the Dean of the Graduate School will be considered only if they are submitted by the chairman of the applicant's advisory committee and as part of the student's entire proposed program of study.

The candidate will submit his proposed programs of course study and research and make application to the Dean of the Graduate School on blanks provided at the office of the Dean of the Graduate School. This application must be accompanied by a critical statement of the student's thesis and by a general plan of his research procedure.

5. Time Limitation for Application. Application for admittance to candidacy must be made before the student has completed more than one-third of the credits allowed toward his Master's Degree. The application should be submitted by the end of the first six weeks of the quarter preceding that in which he completes his work and is to be graduated. In no case will application be honored later than the last week of this same quarter.

Notice of admission to candidacy, together with a letter of instructions concerning the thesis form and final examination, will be sent to the candidate by the Dean. A form on which to make application for graduation will also be enclosed with the letter. This form calls for the payment of a fee of \$10 for official checking and binding of two copies of the thesis.

Thesis

Each candidate for a Master of Science degree must present a thesis on a topic within the field of his major subject which must represent from 9 to 15 hours of the credit presented for his degree. In all cases, the thesis must represent a contribution to the field of knowledge, based on the student's own research, or a treatment and presentation of known subject matter from a new point of view. After final approval by the department, the thesis must be typewritten in standard form and a copy, together with a critically written abstract must be submitted to each member of the student's Advisory and Examining Committee at least two weeks before the date of his final examination. The type written copy and the first carbon copy of the final draft, properly signed by the Major Professor, the Head of the Department, a Representation of the Library, and the Dean of the Graduate School, must be submitted to the College Librarian to be deposited in the Library of the College one week prior to date of graduation. If the student is to be graduated at the June commencement, the thesis must be submitted in its final form by May 20 preceding commencement.

Final Examination

Each candidate for a Master of Science degree will be required to pass a comprehensive final examination on the subjects of his graduate study and on his thesis. This examination may be oral or written or both as his committee may decide, and is open to all faculty members and officials of the Graduate School. Arrangements for the time and place of the examination will be made by the Dean of the Graduate School. A member of the Advisory and Examining Committee, other than the Major Professor, or a representative of the Graduate Council, will be appointed to act as chairman of the examination and will submit to the Graduate Council the results of the examination. For candidates who are to receive their degree at the June commencement the date of the final examination should not be later than April 3. When the examination is passed and the thesis submitted and deposited with the Librarian, the Dean of the Graduate School will present the name of the candidate to the College faculty for approval. He will also instruct the candidate regarding attendance at commencement and on other matters relating to his graduation.

Time Limit for Completing Work for a Master's Degree

Work for a Master of Science Degree must be completed within six years from the date of matriculation as a regular student in the Graduate School if the work is done wholly or in part during the regular academic year. If the work is done entirely in summer sessions, a maximum of seven years is allowed. Older work may be revalidated by examination.

Extension Courses

The amount of extension credit to be allowed will be determined in consideration of the student's entire course program. In no case will more than nine quarter hours of extension credit be allowed as counting toward a degree. All extension courses for which graduate credit is sought must be regularly registered for through the Graduate School, and must have the sanction of the Head of the Department in which the student is doing his graduate work. Credit toward a Master of Science degree will not be granted for correspondence study.

Transfer Credit

A maximum of 9 quarter credits of graduate work satisfactorily completed at another approved Graduate School may be allowed toward a Master of Science Degree. The extent to which such credit may reduce either the course or the residence requirements will be determined by the student's Advisory and Examining Committee subject to the approval of the Dean of the Graduate School and the Graduate Council. In no case will graduate credit received in other institutions be transferred either for credit or in lieu of residence until the student has satisfactorily completed at least 16 credits in residence at the Utah State Agricultural College.

THE DEGREE OF DOCTOR OF PHILOSOPHY

The College offers advanced training leading to a Degree of Doctor of Philosophy in a limited number of fields. With its cooperative connections with the various state and federal research agencies, the College is well equipped to maintain its leadership in the field of irrigation and drainage, in soil physics and in various other phases of soil science and related fields.

More detailed information may be obtained from the Dean of the Graduate School.

Graduation at Close of Summer Session

All students who satisfy the requirements for graduation by the close of the Summer Quarter are listed with the class of the following year and will receive their public graduation at the following Commencement. The graduation of such students however, will be certified by the proper authorities of the College as soon as their work is completed.

Teaching and Research Assistantships

A number of teaching and research assistantships in various departments of the College are available each year to graduate students. Teaching assistantships carry a stipend of \$720 for one-third teaching service on a nine-month basis. Remuneration for research assistantships may vary from \$720 to \$1,200 dependent upon the time of service involved. All assistantships are arranged so as to allow the student to complete work for his Master's Degree in two years. At present, assistantships are available in the following departments: Agronomy, Soils, Soil Physics, Animal Husbandry, Bacteriology, Botany and Plant Pathology, Biochemistry, Chemistry, Dairy Manufacturing, Economics, Education, Agricultural Engineering, Civil Engineering, Engineering and Technology, Physiology, Foods and Nutrition, Child Development, Forestry, Geology, Irrigation and Drainage, Physics, Physical Education, Political Science, Poultry, Public Health, Range Management, Soils and Soil Physics, Sociology, Veterinary Science, Wild Life, Zoology and Entomology.

STUDENT EXPENSES

Resident Students

	Three Quarters	Winter and Spring	Fall Only	Winter Only	Spring Only
Registration Fee	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00
Tuition	51.00	34.00	17.00	17.00	17.00
Student Body	12.00	9.00	6.00	6.00	6.00
Athletic Fee	6.00	4.00	2.00	2.00	2.00
Class Fee	1.00	1.00	1.00	1.00	1.00
Building Fee	20.00	14.00	7.00	7.00	7.00
	<u>100.00</u>	<u>\$ 72.00</u>	<u>\$ 43.00</u>	<u>\$ 43.00</u>	<u>\$ 43.00</u>

If a resident student wishes to attend all three quarters but pay fees on a quarter basis, the payments are divided as follows: Fall, \$43; Winter, \$29; Spring, \$28; making a total of \$100.

Non-Resident Students

	Three Quarters	Winter and Spring	Fall Only	Winter Only	Spring Only
Registration Fee	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00	\$ 10.00
Non-Resident Fee	105.00	70.00	35.00	35.00	35.00
Tuition	51.00	34.00	17.00	17.00	17.00
Student Body	12.00	9.00	6.00	6.00	6.00
Athletic Fee	6.00	4.00	2.00	2.00	2.00
Class Fee	1.00	1.00	1.00	1.00	1.00
Building Fee	20.00	14.00	7.00	7.00	7.00
	<u>\$205.00</u>	<u>\$142.00</u>	<u>\$ 78.00</u>	<u>\$ 78.00</u>	<u>\$ 78.00</u>

If a non-resident student wishes to attend all three quarters, but pay fees on a quarter basis, the payments are divided as follows: Fall, \$78.00; Winter, \$64.00; Spring, \$63.00.

In addition, each student is required to pay a Materials and Laboratory Fee each quarter which varies with the respective schools according to the following schedule:

Agriculture	\$4.00	Forest, Range and Wildlife	
Arts and Sciences	3.00	Management	\$4.00
Commerce	2.00	Engineering and Technology	5.00
Education	2.00	Home Economics	3.00

FEES

The fees listed above with the exception of the Associated Students (Student Body) fees are the minimum fees required by State law. According to an act passed by the Legislature, all legal residents of Utah who enter the College must pay a registration fee of \$10, and, in addition, they must pay a tuition fee of \$17 per quarter. Students who are not legal residents of the state are required to pay a registration fee of \$10 per year, plus a non-resident fee of \$35.00 per quarter, in addition to the tuition fee of \$17 per quarter.

SPECIAL FEES

Special Students—Registration fee	\$10.00
Plus \$2.50 per credit hour (maximum 6 credits)	
Chemistry Laboratory deposit	5.00
Bacteriology 2, 71, 105, 107, 110, 120, 130, 160, 167, 197, 198, 199	3.00
Geology 3, deposit for loss and breakage	5.00
Military Uniform deposit	5.00
Aeronautics 37, 137, 138, 139—\$10.00 per clock hour for dual instruction and \$8.00 per clock hour for solo instruction.	
Horticulture 118	20.00
Welding 41, 41a, 42, 42a, 43, 43a, 44, 44a, 45, 45a, 46 46a, 91, 92, 93, 94, 96, 190, 191 per credit hour	1.50
School of Forest, Range, and Wildlife Management—Senior Field Problems:	
Forestry 146	35.00
Range Management 196	30.00
Wildlife Management 171	30.00
Diploma Fee	5.00
Social Work Certificate	5.00
Cap and Gown rental—Bachelor of Science	2.25
Master of Science	5.00
Late Registration, per day (maximum \$5.00)	1.00
Locker rental	1.50
Master's Degree Fee for binding and proofing thesis	5.00
Teacher placement fee	2.00
Teacher placement re-registration	1.00
Registration as listener in lecture course in which no credit is derived, per subject	5.00
Related Training Courses, 58c per clock hour (or per contract with the Veteran's Administration.)	
Graduate students not in residence and wishing to file thesis credit not to exceed 15 hours shall pay a fee of \$27.00.	
Special examinations may be taken in subjects not registered for, on approval of a special examinations committee, and upon payment of \$2.00 per credit hour.	
Fees for Private Instruction, Music. The charge is on the basis of 1½ credit hours per quarter, consisting of 10 private lessons. Authorized instructors are as follows:	
Christiansen, N. W.	\$35.00
Christiansen, Mrs. N. W.	30.00
Clark, S. E.	30.00
Greenwood, Maxine	25.00
Lundquist, Thelma	20.00
Odd, Mrs. Wallace	20.00
Pahtz, George	30.00
Poznanski, Mischa	30.00
Thatcher, Mrs. G. W.	35.00
Thatcher, Patience	35.00
Torbensen, Eldon	30.00
Walti, Walter	35.00
Walti, Mrs. Walter	30.00

Fees for Private Instruction, Speech. The fee for Speech 12, 112 is \$17.50 per credit hour per quarter, consisting of 10 private lessons. Authorized instructors are as follows:

Hardman, Stuart
Hansen, Burrell
Hansen, Harold I.
Jones, E. LeRoi

Mecham, Merlin
Morgan, Floyd T.
Myers, Chester J.
Robinson, Rex E.

Rosenthal, W. M.
Thornley, Gwendella

Teacher Placement Fee, \$2. Required of all students applying for Teacher's Certificate.

After the first week of each quarter, students changing registration must pay 50 cents for each change.

Registration is not completed until the student has presented his fee card at the cashier's window, Secretary's Office, and settled for his fees, and filed his registration cards with the Registrar's office.

All students, when paying fees, are given official receipts from the Secretary's Office. These receipts must be presented before refunds are allowed.

All fees except registration fee will be refunded to any student withdrawing from the school by the end of the third week of the quarter. No refunds are allowed after the third week.

According to the constitution of the Associated Students, every regular student must obtain, at time of registration, a Student Body card which will admit him to all activities controlled by the Associated Students; athletic events—football, basketball, tennis and track—dramatics and musical entertainments, socials, lectures, etc., and, in addition, give him a copy of the annual yearbook and a subscription to the College paper. This system has been found to be a great saving to the students and a most excellent means of fostering proper interest in student activities.

Since all women students are required to take Physical Education, they must provide themselves with gymnasium suits and gymnasium shoes. The cost is about \$5.00.

Each student in Foods and Dietetics, Home Nursing and Household Administration 150, must provide herself with two washable white uniforms.

The fee for Course 150—General Home Economics which is required for Home Economics education certification is \$35.00 for the one-half quarter residence in the Home Management House.

The College maintains a modern, well-equipped cafeteria, where students may eat at cost.

Good board and room in private homes costs from \$10.00 to \$12.00 a week. By renting rooms and boarding themselves, students are able to reduce considerably the cost of room and board.

Students are held responsible for damage done by them to College property.

SCHOLARSHIPS, FELLOWSHIPS, AWARDS

The Johansen Scholarship Fund of \$5,000, a gift of the late Mrs. Johana Johansen, provides scholarships annually, worth in the aggregate from \$125 to \$150, for help of worthy students of Junior and Senior rank. Applications for this scholarship for the succeeding year must be filed with the chairman of the Awards and Honors committee on or before April 1.

The Lieutenant Clyde Parker Baugh Memorial Fund of \$10,000, a gift of Mr. and Mrs. Wilford F. Baugh, provides four scholarships annually for deserving students of high scholarship and leadership. Applications must be submitted by April 1 to Awards and Honors Committee chairman.

KSL Meritorious Scholarships. KSL awards two scholarships, one in technical radio work and one in script writing or broadcasting. Applications should be presented to chairman of Awards and Honors Committee by April 1.

The 1927 Class Gift to the College yields an annual income sufficient to provide two scholarships of \$125 each. Application should be made by Juniors to the Awards and Honors Committee on or before April 1. Application must be accompanied by an approved outline of a proposed study project to be completed during the senior year and submitted to the Awards and Honors Committee not later than April 1. Two copies of the complete thesis are to be filed in the College library.

Rhodes Scholarships. A number of candidates for the Rhodes Scholarships at Oxford University, England, are selected each year from Utah. High scholarship and some definite quality of distinction, whether in intellect, character, or personality, or in any combination of these, are the most important requirements for a Rhodes Scholarship and it is upon this that the committee will insist. The present value of the scholarships is £500. Seniors of graduate students are generally chosen as candidates. It is suggested, however, that students would do well to begin preparing for them in earlier years. Full information and application blanks may be obtained from Dr. Sherwin Maeser, college representative of the Rhodes Scholarship Committee.

The Danforth Summer Fellowship is awarded jointly by the Danforth Foundation and the Ralston Purina Mills to an outstanding member of the Junior class in the School of Agriculture. The award covers expenses for two weeks in St. Louis and vicinity, and two weeks of leadership training at the American Youth Foundation Camp on Lake Michigan. Forty students from as many colleges are awarded this fellowship. Additional information and application blanks may be obtained from the Dean's office. Applications should be filed with the Dean of the School of Agriculture on or before April 1.

The Rollo M. Rich Memorial Scholarship is awarded annually to an outstanding student of the Upper Division who is a major in the school of Agriculture and who has filled a mission for the L. D. S. Church or has otherwise participated in activities of the L. D. S. Church.

Louisa Y. Robinson National Woman's Relief Society Scholarship. A gift of \$5,000 from the General Board of the National Woman's Relief Society creates a perpetual fund bearing the name of Louisa Y. Robinson, the annual earnings of which are given to a Latter-day Saint woman student eligible for admission to the Graduate Division of Social Work. A research paper in required. Applications should include a transcript of credits and three letters of recommendation, one of which must be from the Ward Relief Society President of the ward in which the student lives. One hundred dollars is payable November 1 and the rest on May 1, provided the research paper has been submitted and adjudged satisfactory.

Sears Roebuck and Company Scholarships: For Freshmen in the School of Agriculture the company offers 25 scholarships of \$100 each, \$50 of which is paid at the beginning of the fall term and \$25 at the beginning of the winter and spring terms. Winners are determined on the basis of scholarship, financial need, interest in agriculture, citizenship, moral integrity and rural leadership. The winner of this award who has the best scholarship record at the end of his freshman year will receive an additional scholarship of one or two more years. All applications must be submitted to the Dean of Agriculture before June 1. Application blanks and additional information may be obtained from the Dean's office.

Borden Agricultural Scholarship Award of \$300 is given to the student who in all college work preceding his senior year has achieved the highest average grade among students in agriculture completing two or more dairy subjects.

The Burpee Award in Horticulture is an annual award of \$100 made possible through a grant from the W. Atlee Burpee Company, seed growers, Philadelphia, Pa., and Clinton, Iowa. It is made on the basis of scholarship, practical experience, and interest in flower and vegetable seed growing.

The W. Atlee Burpee Award in Floriculture is an annual award of \$100, made possible through a grant from the W. Atlee Burpee Company, seed growers, Philadelphia, Pennsylvania and Clinton, Iowa. It is made on the basis of scholarship, practical experience and interest in floriculture.

Swift and Company Essay Contest. Each year Swift and Company conducts an essay contest. The winner is awarded a trip to the International Livestock show at Chicago where he will spend approximately a week studying the meat packing industry. All essays must be submitted in the Dean's office on or before November 1. Further information may be obtained from the Dean's office.

The Leadership Challenge Cup is to be awarded each year to a Senior student in Agriculture who has exhibited the greatest measure of constructive organization and leadership in the School of Agriculture through his College course.

The American Rambouillet Sheep Breeders' Association Challenge Cup was donated to the Annual Husbandry Department by the American Rambouillet Sheep Breeders' Association, to be presented each year to the student showing the greatest efficiency in fitting and showing Rambouillet sheep.

The Ogden Union Stock Yards Challenge Cup, a gift of the Union Stock Yards Company, Ogden, is awarded each year to the student who shows the most proficiency in the judging of beef cattle.

The Hawaiian Steamship Company's Challenge Cup, a gift of the Hawaiian Steamship Company, is to be awarded each year to the student who shows the most proficiency in the judging of wool.

The Salt Lake Union Stock Yards Company Challenge Cup, a gift of the Union Stockyards Company, Salt Lake City, is awarded each year to the student who shows the greatest proficiency in judging hogs.

The John K. Madsen Challenge Cup, a gift of John K. Madsen, Mt. Pleasant, Utah, is awarded each year to the student who shows the most proficiency in the judging of sheep.

The Phi Upsilon Omicron Scholarship of \$25 is given annually by the Kappa Chapter of that organization to the Freshman girl in the School of Home Economics ranking highest on the following points: (a) scholarship; (b) participation in student activities; (c) service and cooperation; (d) leadership; (e) moral character; (f) judgment and reliability. In addition, the candidate must be a member of the Home Economics Club.

Danforth Foundation Home Economics Fellowships: The first, awarded jointly by the Danforth Foundation and the Ralston Purina Company to an outstanding junior in the School of Home Economics. The award provides for two weeks' study of various business problems in St. Louis, followed by two weeks of leadership training at the American Youth Foundation on Lake Michigan.

The second, awarded by the Danforth Foundation to an outstanding freshman in home economics. The award provides two weeks' leadership training at the American Youth Foundation Camp.

Home Economics Awards. Certificates of merit are conferred annually upon senior women in Home Economics adjudged worthy by faculty and Senior students upon the following basis: (a) application of Home Economics ideals to daily living, 50 points; (b) leadership in class work and other activities, 50 points. The number of awards shall not exceed 5% of the total graduating class. The candidates eligible shall have a grade point average of two or better.

An Annual Scholarship of \$25 is awarded by Chi Omega Fraternity to the girl majoring or minoring in Social Sciences who gives evidence of superior scholarship and ability to make a contribution to organized group life. The Committee of Awards is appointed by Chi Omega Fraternity each year from the teaching staffs of the Sociology and Economics Departments.

The Associated General Contractors Scholarship Award. A gift of the Intermountain Chapter, A.G.C., provides a scholarship grant of \$200 to a Junior Engineering student. The award is made on the basis of scholarship, promise as an engineer, and need. Selection to be made by special committee representing the A.G.C. and the Civil Engineering Department. Applications for the succeeding year must be filed with the Dean of Engineering on or before April 1.

A.S.C.E. Membership Award. Junior Membership in the American Society of Civil Engineers, awarded by the Intermountain Section, A.S.C.E., to a graduating senior in Civil Engineering on basis of scholarship, activities, and personality. Selection is made by the Intermountain Section upon recommendation by the Engineering Faculty.

Engineering Faculty Award. Junior Membership in the A.S.C.E. or A.S.A.E. awarded by the Engineering Faculty to a graduating senior in Engineering on basis of scholarship and promise of success in engineering. Selection to be made by the Engineering Faculty.

Kantilever Klub Award. To the outstanding Sophomore Engineering student for scholarship and engineering interests. Selection to be made by the Kantilever Klub, an honorary engineering society of upper classmen.

Deseret News Professional Internship. The News offers the outstanding junior student in journalism a scholarship including one year's tuition at the College and employment with the News, either at the Salt Lake City office or at one of its bureaus, during the summer months between the junior and senior years. The winner is selected by judges representing USAC and the News.

Medals and Other Awards

The American Legion Military Medal, a gift of the Logan American Legion Post, is awarded each year to the letterman who maintains the highest scholastic record during the year, and who exhibits the most wholesome attitude towards Military training.

The R. O. T. C. Medal, a gift of the institution, is awarded each year to the student in Military Science and Tactics who most nearly represents the ideal that the Reserve Officers' Training Corps is striving to develop, upon the following basis: (a) Character, 20 points; (b) Scholarship, 15 points; (c) College activity, 15 points; (d) Leadership, 20 points; (e) Aptitude for and interest in Military Science, 20 points; (f) Physique and bearing, 10 points.

The Sons of the American Revolution Medal, a gift of the National Society of the Sons of the American Revolution, is awarded each year to the non-letterman, who is a member of the R. O. T. C., and has shown the greatest interest in his military work.

The Utah State Agricultural College Science Medal, a gift of Director Emeritus William Peterson, is given each year to the student writing the best review of recent scientific research in either mathematics, physics, chemistry, geology, zoology, botany or astronomy.

Scholarship A's in the form of gold pins are given to students who present evidence that their grades are all "A's" for three consecutive quarters of their residence. At least fifteen credits exclusive of basic Physical Education and basic Military Science must be carried. The grades of any quarter can be used but once towards a Scholastic A award.

Alpha Kappa Psi Scholarship Award. Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at the Utah State Agricultural College, awards annually the Alpha Kappa Psi Scholarship Medallion to the male senior in Commerce who possesses the highest scholastic average for four years of work taken in this College.

Alpha Kappa Psi Scholarship Award. Alpha Kappa Psi Fraternity, Alpha Theta Chapter of which is established at Utah State Agricultural College, awards annually the Alpha Kappa Psi Scholarship Medallion to the male senior of the Junior Class in Commerce who possesses the highest scholastic average for three years of work taken in this College.

Theta Chi Award. Ten dollars is awarded annually by the Theta Chi Women's Business Fraternity to the Junior girl registered in the Secretarial Science department who has the highest scholastic record in Commerce.

Delta Beta Chi Award. Ten dollars is awarded annually by the Delta Beta Chi Chemistry Fraternity to the Freshman or Sophomore chemistry student who writes the best essay on some subject in Chemistry.

The William Alger Awards. A gold key is awarded annually by Alpha Epsilon Delta, premedical society, to the outstanding Freshman premedical or pre dental student. Scholarship, character and possibilities in medicine or dentistry represent the basis for the award.

Blue Key Award. Each year Blue Key Honorary Service Fraternity awards a "service plaque" to an outstanding underclass male student (Freshman or Sophomore). Candidates are judged on college activities, scholarship, service to the College, and moral character. Application forms can be obtained from the organization and must be filed with the Blue Key Awards Committee on or before April 15.

Faculty Women's League Scholarship Award is awarded to Senior women and is based on scholastic records for full undergraduate work. To be eligible for this award, candidates must have spent at least two years at this institution.

Faculty Women's League Democracy Award is awarded to Senior women. Candidates must have evidenced the best understanding of the democratic ideal in its application to college life, as exemplified by the following considerations: (1) Awareness of issues vital to college life, (2) individual responsibility for their solutions, and (3) accommodation of individual interests to what seems to be the common good.

The College Award is conferred annually upon the male student of the institution who shows evidence of being able, in greatest measure, to repay the nation the investment which it has made in him, on the following basis:

- (a) The potential vocational or professional efficiency of the student as shown by his scholarly attainment, industry, natural ability and talent (50 points); and
- (b) His patriotism, honesty, and good judgment as a student citizen, as an indication of his future attitude as a voter or public servant, combining a progressive spirit with a love of country and a concern for the safety and development of American institutions of liberty and justice and his qualities of social leadership, as shown in student affairs, based upon physical and moral cleanliness and strength of character (50 points).

A College Award is also conferred annually upon the women students of the Institution who show evidence of greatest measure of (a) potential vocational or professional efficiency as shown in scholarship, industry, and natural ability (50 points); and (b) womanly qualities, development of the social graces, not necessarily social prominence, and attitude of mind (50 points).

Loan Funds

The U. S. A. C. Faculty Women's League has a loan fund for women students of the College. Loans may range from \$50 to \$200. Preference is given Senior women. Loans are made at any time during the year when money is available.

The Senior Loan Fund. a gift of the class of 1911, and added to by the class of 1922, has helped many students through school.

Rotary Club Senior Loan Fund. The Logan Rotary Club has provided a special loan fund to assist students in meeting expenses during their Senior year. Further information may be obtained from Mr. N. D. Salisbury, First Security Bank, Logan, or the chairman of the Awards and Honors Committee.

The Robert L. Judd Loan Fund was given by Mrs. Judd in honor of her late husband. Loans are available to undergraduate men who have ability and are in need of financial assistance. The fund is administered by committee consisting of the Secretary and Treasurer, the Dean of Students, and Mrs. Phillip A. Bullen.

GUIDANCE PROGRAM

The College guidance program is intended to help the student discover his needs, assess his potentialities, and achieve effective self-direction. This program is closely integrated with the instructional program of the College. Every member of the faculty serves in some guidance capacity.

The instructional phases of the guidance program are centered in the offices of the academic deans. Each dean in turn selects members of his staff to serve as advisers to the students of his School.

The Dean of Students as Chairman of the Guidance Committee is the general co-ordinator of the entire guidance program. In addition matters pertaining to foreign students, fraternities, clubs, student employment, and personal assistance are centered in his office.

The Dean of Women serves as an adviser to all women students and to all women's organizations. She also serves as co-ordinator of campus social affairs and as a supervisor of the college-owned residence halls for women students.

Each sorority house and residence hall is supervised by a competent house mother, who is directly responsible to the Dean of Women. House regulations are drawn up by committees made up of student house managers, student executives, house mothers, and the Dean of Women.

Women students living in apartments in town are urged to report all illness directly to the medical staff or to the Office of the Dean of Women. All students are welcome to bring their individual problems to the office of the Dean.

PSYCHOLOGICAL CLINIC

The Department of Psychology conducts a psychological clinic with services available to students in the College, to the public schools of the state, to child welfare and other public welfare agencies, to juvenile courts and adult probation and parole officers, and to private individuals who may apply for them. The services include

1. Educational and vocational guidance.
2. Diagnosis and guidance for gifted, subnormal, and delinquent children.
3. Diagnosis and recommendations for treatment of conduct and personality maladjustments.
4. Diagnosis and recommendations for remedial instruction for achievement difficulties in reading, language, arithmetic, general study habits, and other subjects.
5. Assistance to speech correctionists in the diagnosis and corrective treatment of speech defectives.
6. Administration of tests to determine matriculation status of students who have not completed their high school requirements.

Students desiring appraisal of ability, interests, etc., may receive this service through the facilities of the Department of Psychology.

MARRIAGE COUNSELING SERVICE

The Department of Sociology and the Division of Social Work conduct a marriage counseling service for all students and their families, without cost. The services include:

1. Dating and courtship guidance.
2. Pre-marital consultation.
3. Social hygiene consultation.
4. Diagnosis and consultation regarding problems of marital conflict, parent-child relations.
5. Diagnosis and referral of more specialized problems to medical, psychiatric, legal and other specialists.

Consultation by appointment only. Call in person or phone the Secretary of the Department, Room 210 Main.

COLLEGE CITIZENSHIP

The College expects its students to exemplify those standards of dependability, honor, and integrity which characterize responsible citizens.

"Students are expected to show both within and without the College such respect for order, morality, personal honor, and the rights of others, as is demanded of good citizens. Failure to do this will be sufficient cause for removal from the Association." **Sec. 5, Constitution, Associated Students of Utah State Agricultural College.**

RELIGION

The officers of the College are deeply interested in the spiritual and moral growth of the students. Every student is encouraged to affiliate with the church of his choice immediately upon registering at the College.

Outstanding religious leaders of the Catholic, Protestant and Latter-day Saint faiths cooperate with the College in serving the students of their respective churches. Accredited courses in religion are also offered by scholars representing each of these groups.

STUDENT HEALTH SERVICE

The following medical service is available to students on the U. S. A. C. Campus.

1. Physical examinations are made of all new students and of all who participate in athletic and physical education activities. A health record is kept of every student.
2. Re-checks and follow-up medical care are given students who require special observation.
3. Laboratory tests, blood counts, urinalyses, and Wasserman tests are given as part of the physical examinations, if indicated, or as aids to physicians in making a diagnosis.
4. Immunization against smallpox is given without cost to the student. For other vaccinations or tests that students request, the student furnishes the vaccine or serum.
5. The Health Service offers out-patient dispensary care, with an unlimited number of office calls. Office hours: 8:00 a.m. to 5:00 (including noon hour) daily, on school days.
6. X-Ray, for students who are injured while participating in school activities. When X-Ray is authorized by the school physician, it is made without cost to the student.
7. Infirmary or bed care is not furnished.
8. The physician is employed on a part-time basis but is available for emergency calls for injuries which occur during campus activities.

The College physician will call, during the morning hours, on students who are ill in their homes. Therefore, he should be notified before noon on the day of illness. Students who are ill and come to school, regardless of their physical condition, should come to the Student Health Service in the Smart Gym before attending classes. This would help to safeguard the school against contagious disease. Prompt reporting of illness would expedite care and prevent many of the midnight calls. In the past the majority of night calls have been for illnesses of over 24 hours' duration and should have received attention during the regular school hours.

9. The physician does not make home calls for accidents which occur off the campus or in the homes of the students.

10. The Student Health Service is located in Room 12, Smart Gymnasium.

11. The physician's hours are 9:00 a.m. to 12:00 noon daily, on school days.

12. If you wish to contact the Health Service call Extension 51. The nurses' hours are from 8:00 to 5:00 daily, on school days.

13. This service does not include the wives or children of students.

14. The students do not pay a health fee.

SPEECH CLINIC

The Speech Clinic provides special classes to meet the needs of foreign students. Both group and individual instruction at the Speech Clinic can be obtained by foreign students so that they can learn the use of American English as rapidly as possible.

Remedial training is available for those individuals possessing speech handicaps. The types of problems handled include stuttering or stammering, stage fright, slow speech development in children, baby talk, lisping and other disorders of articulation, cleft palate and hare lip, paralytic speech, foreign accent and dialectic speech, "nervous" speech conditions, nasal speech, high or thin voices, etc. All college students who have defective speech should register with the speech clinic where they will receive immediate attention. This training is also available to non-college students.

COURSES OF INSTRUCTION

In the following section the courses of instruction offered by the College are listed under the names of the seven academic Schools into which the Institution is organized.

Courses numbered below 100 are Lower Division courses.

Courses numbered above 100 are Upper Division courses. These may be pursued by a Freshman or a Sophomore only with permission of the Instructor of the course and the student's Dean.

Courses numbered above 200 are Graduate courses. Many Upper Division courses may also yield Graduate credit.

The amount of credit in quarter hours for a course and the quarter in which the course is given are indicated in parentheses at the end of the course description. "F" is the abbreviation for Fall, "W" for Winter, "S" for Spring, and "Su" for Summer.

SCHOOL OF AGRICULTURE

General Information	67
Agriculture Curricula	68
Agricultural Economics and Marketing	71
Agricultural Education	74
Agronomy	75
Animal Husbandry	80
Bacteriology and Public Health	83
Botany and Plant Pathology	86
Dairy Industry	87
Horticulture	91
Landscape Architecture and Planning	95
Poultry Husbandry	96
Vegetable Crops	97
Veterinary Science	99
Zoology, Entomology and Physiology	100

General Information

THE well trained person is the one who receives employment opportunities in agriculture as well as in other fields of endeavor. Opportunities in crop and livestock production, marketing, extension work, teaching, research, and the various commercial fields connected with agriculture await students who have an adequate background of basic and technical training. Food shortages throughout the world call for increased production and better distribution and for trained personnel to supervise these programs. Better adapted and higher yielding crops and breeds of livestock, better pest and disease control methods are needed to rehabilitate territories despoiled by war. Increase of soil fertility through prevention of erosion, more widespread use of fertilizers, better control of soil moisture are problems awaiting solution by trained men. Thus a great opportunity and a challenge are open to those students who have an interest and an aptitude for agriculture and who are willing to prepare themselves properly.

Utah State Agricultural College is well equipped to train young men to meet these needs. With the technical courses in crop and animal production, agricultural economics and rural social science, soil management, and others, instruction is offered in mechanic arts and in the basic sciences that underlie practical agriculture. Training is also given in English, literature, history, political science, the fine arts, hygiene and public health, and education, all of which supplement the practical and scientific agricultural training and contribute to the well-rounded education of students.

Instruction includes not only the principles, but the practice of agriculture. The College farms, dairy manufacturing plant, livestock barns, plant breeding plots, gardens, orchards, and technical equipment offer excellent opportunities for the combination of scientific study and practical experience. Outstanding representatives of the principal livestock and poultry breeds best adapted to Utah conditions afford a "standard of perfection" in desirable type and form for the student judge.

The College maintains an outstanding herd of Hereford and Shorthorn beef cattle. The Sears-Roebuck Foundation has contributed in recent years \$12,000 towards the purchase of foundation beef cattle. Four breeds of sheep, Rambouillet, Columbia, Hampshire, and Southdown, are maintained for comparative study. Duroc Jersey swine, registered Percheron horses, and two thoroughbred stallions are also kept. The College dairy herd is made up of purebred Jersey and Holstein-Friesian cattle. The important breeds of chickens and turkeys are available at the new poultry and turkey farm. These animals afford teaching materials and also experience in the care and handling of livestock.

Utah Agricultural Experiment Station is bringing to light better methods of feeding, more productive systems of cropping, more valuable strains of fruits, crops and livestock, more remunerative systems of marketing agricultural products, and other improvements. These investigations are studied by the students first hand, and through student employment, a number take an active part in conducting the research work of the Experiment Station. This arrangement gives to the student clearer insight into scientific methods and, at the same time, valuable practical experience. Special attention is given improved methods in farming operations, in the use of tools and machinery, and in the management of livestock and crops.

The great practical value of the various curricula of the School of Agriculture is shown by the records of those students who have completed them and who have gone back to the farm, or who, after graduation, have taken up the work of specialists as teachers or investigators. Such men are proving themselves leaders in their chosen work.

CURRICULA IN AGRICULTURE

Students entering the School of Agriculture may pursue one of three courses leading to the Bachelor of Science degree in Agriculture. These are as follows:

1. **General Agriculture**, which is designed to meet the needs of the student who desires a broad general training in scientific and practical agriculture.
2. **Specialized Agriculture**, in which the student chooses to specialize or major in one of the departments of the School of Agriculture.
3. **Technical Agriculture**, which is for the student who plans to go on with graduate study in one of the basic agricultural sciences, or who plans to enter a field of employment in which technical training is required.

GENERAL AGRICULTURE

The course in general agriculture is designed to meet the needs of those students who desire a broad general training in scientific and practical agriculture. The curriculum for this course is partially prescribed as outlined on this page.

Unless the student has chosen a specific phase of agriculture in which to major, it is usually best for him to follow the curriculum in general agriculture for the first two years. Later, when he decides to major in a specific field, he can arrange to do so without serious complications.

The prescribed courses and minimum number of credits in the various fields are as follows:

(a) Minimum Requirements in Following Divisions:

	Credits
Agricultural economics	9
*Applied plant sciences	26
**Applied animal sciences	26
Engineering and technology	9
Total	70

(b) Physical Science, Biology, Social Science, and Language and Arts:

Physical Science	Credits	Total
Math. 34 or 35	3 or 5	
Chem. 10, 11 & 12 or 3, 4 & 5	15	18 or 20
Biology		
Bot. 24 or 25	5	
Bact. 1 & 2 or 70	5	
Zoology 2 or 3 & 4	5 or 10	
Zoo. 112	5	
Ent. 108	5	
Bot. 130	5	30 or 35
Social Science		
Principles of Economics 53	3	8
Other social science courses (See College group requirements)	5	

*Not more than 15 credits of the 26 to be taken in one department, and the balance to be selected from other plant science departments. Soils 56 is required as part of the 26 credits.

**Not more than 15 credits of the 26 to be taken in one department, and the balance to be selected from other animal science departments.

Language and Arts		
Eng. 10 & 110	9	
College group requirements		
(See College group requirements).....	8	17
(c) Military Science or Physical Education	6	6
		<hr/>
		79 to 86
Total credits prescribed	149	
Elective	37	
	<hr/>	
Total	186	

SPECIALIZED AGRICULTURE

A student may major in one of the following departments: Agricultural Economics and Marketing, Agronomy, Animal Husbandry, Bacteriology and Public Health, Botany and Plant Pathology, Dairy Husbandry, Horticulture, Poultry Husbandry, Vegetable Crops, or Zoology, Entomology and Physiology. Information concerning the curriculum for a major in any of these departments may be obtained from the head of the major department, who should be consulted before registering.

In addition to major and minor requirements as specified by each department, the student majoring in specialized agriculture is required to take a minimum of one three-credit course in each of two departments in the applied plant sciences and one three-credit course in each of two departments in applied animal sciences.

He must also complete the following:

Math 34 or 35

Chem. 10, 11 & 12 or 3, 4 & 5

(Majors in agricultural economics may substitute physical science 31 and 32 and another 5 hours of exact science for 15 hours of chemistry)

A minimum of 14 credits in the following courses:

Botany 24 and 25

Zoology 2, 3 and 4

Bacteriology 1, 2 and 70

Zoo. 1 or Bot. 1

Phy. 4

(See various department course requirements in this group.

Zoo. 1, Bot. 1, and Phy. 4 are not accepted by some departments)

Prin. of Econ. 53, 3 credits; Ag. Econ. 102, 162, 6 credits.

Social science group, 8 credits

Language and Arts group, 8 credits

English 10 & 110

Agron. 56

A total of 186 credits, 54 of which are of upper division grade, and a minimum of 1 credit each term for six terms in military science or physical education are required for graduation from the School of Agriculture.

TECHNICAL COURSES

For students who plan to do graduate work or to enter a field of employment in which technical training is required, a technical course is provided in each of the following fields: Agricultural Economics, Agricultural Mechanics, Animal Husbandry, Bacteriology, Botany, Dairy Husbandry, Dairy Manufacturing, Field Crops, Soils, Soils and Irrigation, Vegetable Crops, Zoology, Entomology, and Physiology. Students may register for these courses only upon permission of the department and the Agricultural Council. Minimum requirements in addition to the general college group requirements include two three-credit courses in two departments in both applied plant sciences and applied animal sciences, and a three-credit course in principles of economics and one in agricultural economics.

NON-DEGREE COURSE IN AGRICULTURE

The School of Agriculture also offers a two-year non-degree course in practical agriculture for students who do not wish to take more than two years of college work. A student may register for any of the regular non-prerequisite production, marketing and management courses in the School of Agriculture. Emphasis is placed on practical farm problems.

Suggested Courses Open To Students In The Non-Degree Course In Agriculture

Agricultural economics 53, 70, 102, 162

Agricultural engineering 14, 15

Agronomy 1, 56

Animal husbandry 1, 10, 15

Dairy husbandry 1, 3, 6, 7

Horticulture 1, 8, 10

Irrigation and drainage 10

Landscape architecture 3

Poultry husbandry 1 & 2, 8

Vegetable crops 1 & 2

Veterinary science 20

Besides completing a 20-credit major in the plant sciences, the animal sciences, or agricultural economics, the student is required to take six credits in the groups in which he does not major. For example, a student majoring in animal science must complete in addition to 20 credits in his major field, 6 credits in plant science, 6 credits in agricultural economics, and 6 credits in agricultural engineering. He is also required to take the following courses:

	Credits
Biology	5
English 10	5
Math. 34	3
Social Science	5

Students in the non-degree course must complete 90 credits to obtain a certificate.

Agricultural Economics and Marketing

Administered jointly by the School of Agriculture and the School of Commerce

W. P. Thomas, G. T. Blanch, D. A. Broadbent, V. L. Israelson, Professors; **R. H. Anderson, E. M. Morrison,** Associate Professors; **E. W. Lamborn, M. H. Taylor,** Assistant Professors; **H. R. Hockmuth, L. A. Reuss,** Collaborators in Research.

Students majoring in the Department of Agricultural Economics and Marketing may be graduated from either the School of Agriculture or the School of Commerce. The choice of school should be determined by the field in which the student intends to do his minor work.

Those graduating from the School of Agriculture must satisfy requirements for graduation from that School in addition to other courses prescribed by the major professor. Those graduating from the School of Commerce must, in addition to satisfying the requirements for graduation from that School, include certain basic agricultural courses prescribed by the major professor.

To meet the requirements of students who plan to do graduate work or to enter into a field of employment where technical training is required, a special course has been provided for such students majoring in agricultural economics. Students satisfying requirements as prescribed for this course may graduate from either the School of Agriculture or Commerce. A schedule of this prescribed course may be obtained from the office of the Department of Agricultural Economics.

Master of Science Degree

The Department offers opportunity for research and graduate study leading to a Master of Science Degree. The research facilities of the Department for training of graduate students are greatly augmented by the investigations conducted in agricultural economics by the Department staff with the assistance of graduate students. The following courses may be used for graduate credit by students majoring in the Department: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120, 121, 122. For graduate students in other departments the following courses may be used for graduate credit: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120.

A minimum of three credits in the principles of economics is a prerequisite for all courses in Agricultural Economics.

Suggested Course of Study for Students Majoring in Agricultural Economics in School of Agriculture

FRESHMEN

Fall		Winter		Spring	
Courses	Hours	Courses	Hours	Courses	Hours
Accounting 1	5	Accounting 2	5	English Literature	
Speech 1	5	Math. 34	3	40	3
Zoology 1 or		Bact. 1	4	Math. 35	5
Botany 1	5	Agronomy 1	3	Physiology 4	5
M. S. 1	1	M. S. 2	1	Animal Husb. 1	3
	16		16	M. S. 3	1
					17

SOPHOMORE

Fall		Winter		Spring	
Courses	Hours	Courses	Hours	Courses	Hours
Chemistry 10 or		Agron. 56	4	Chem. 12 or	
Phys. Sci. 31	5	Chem. 11 or		Trig. 46	5
English 10	5	Phys. Sci. 33	5	Veg. Crops or Hort.	3
Ag. Econ. 53	3	Econ. 52	5	Pol. Sci. or Soc.	5
Dairy 1 or Poul. 1	3	Elective	3	Elective	3
M. S. 4	1	M. S. 5	1	Typing	1
	16		18	M. S. 6	1
					18

JUNIOR

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
English 110	4	An. Husb. 10	5	Ag. Econ. 120	3
Ag. Econ. 70	3	Ag. Econ. 102	3	Ag. Econ. 162	3
Ag. Econ. 121	3	Ag. Econ. 103	2	Ag. Econ. 106	5
Ag. Econ. 104	3	Ag. Econ. 122	3	Irrig. 10	4
Econ. 165	3	Econ. 107	3	Econ. 108	3
	16		16		18

SENIOR

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Plant Science	3	Animal Science	3	Ag. Econ. 112	3
Ag. Econ. 230	1	Ag. Econ. 231	1	Ag. Econ. 232	1
Ag. Econ. 240	2	Ag. Econ. 241	2	Ag. Eng. 105	5
Ag. Eng. 14	3	Ag. Econ. 105	3	Ag. Econ. 202	3
Irrig. 149	3	Ag. Eng. 15	3	Elective	5
Ag. Econ. 114 or 116	3	Ag. Econ. 115	3		
Elective	2	Elective	2		
	17		17		17

RURAL ECONOMY

53. Principles of Economics. Basic principles of economics with emphasis on those of particular importance in agriculture. (3 F, W or S)

Israelsen, Morrison

55. Principles of Agricultural Economics. Economic principles underlying agricultural production and distribution and the relationships of agriculture to other industries. (Not given 1950-51)

104. Economic Development of Agriculture. Geography and use of agricultural resources with special reference to the United States. (3F)

Israelsen

230, 231, 232. Public Problems in Agriculture. Seminar courses to familiarize students with economic implications of problems confronting agriculture. Special references to postwar problems. (1F, 1W, 1S)

Thomas

Farm Management, Land Economics, and Agricultural Finance

70. Farm Accounts. Farm accounts and their application to the organization and management of farms and to the filing of income tax statements. (3 F or W)

Blanch and Morrison

102. Principles of Farm Management. Principles underlying organization, management, and financial success of farms. (3 F, W or S)

Blanch and Morrison

103. Principles of Farm Management. Laboratory. Prerequisite or taken simultaneously: Ag. Econ. 102. (2 F, W or S)

Blanch and Morrison

105. Agricultural Credit. Principles of agricultural credit. Emphasis on problems and methods of financing agriculture. Prerequisite or taken simultaneously: Ag. Econ. 102. (3W)

Morrison

106. Land Economics and Utilization. Economic principles underlying utilization, valuation, and tenure of agricultural land. Attention given prevailing land policies and methods and techniques involved in dealing with problems of land use. (5S)

Blanch

202. Advanced Farm Management. Primarily to give students advanced training and experience in farm management. Prerequisite: Ag. Econ. 102 and 103. (3S)

Blanch

205. Advanced Agricultural Credit. Primarily to give students advanced training and experience in agricultural finance. Prerequisite: Ag. Econ. 105. (3S)

Morrison

206. Farm Appraisal. A basic course in land appraisal and economic classification of land. (2S)

Blanch

Marketing and Prices

- 62. Principles of Marketing.** Principles, methods, and practices of marketing. (5F, W or S) **Israelsen and Anderson**
- 112. Farm Cooperatives.** Principles of cooperation, organization, operation, and management of cooperative sales, purchasing and service associations. (3S) **Thomas**
- 113. Analysis of Farm Cooperatives.** Primarily to give students advanced training and experience in agricultural cooperation. Prerequisite or taken simultaneously: Ag. Econ. 112. (2S) **Thomas**
- 114. Marketing Fruits and Vegetables.** The principles of marketing as applied to the marketing of fruits and vegetables. (3F) **Lamborn**
- 115. Marketing Poultry and Dairy Products.** The principles of marketing as applied to the marketing of poultry and dairy products. (3W) **Anderson**
- 116. Marketing Livestock and Livestock Products.** The principles of marketing as applied to the marketing of livestock and livestock products. (Not given 1950-51) **Israelsen**
- 120. Agricultural Prices.** Economic principles underlying prices. Attention given to factors, policies, and programs as they relate to and influence agricultural prices. (3S) **Thomas**
- 121. Statistical Methods.** Statistical methods used in analyzing prices and other economic data. (3F) **Israelsen**
- 122. Statistical Methods.** Interpretation of statistical data and application of statistical techniques to specific price and production problems. Prerequisite: Ag. Econ. 121. (3W) **Israelsen**
- 162. Marketing Agricultural Products.** Economic principles underlying the production, demand, and distribution of agricultural products. (3 F, W or S) **Broadbent and Thomas**
- 163. Advanced Marketing.** Principles of marketing and their applications to specific problems. Prerequisite: Ag. Econ. 62 or 162. (3S) **Lamborn**

General Graduate Courses

- 214. Research in Agricultural Economics.** Thesis. Any quarter. Time and credit arranged. **Staff**
- 215. Special Problems in Agricultural Economics.** Any quarter. Time and credit arranged. **Staff**
- 240. Research Methods in Agricultural Economics.** (2F) **Blanch**
- 241. Research Methods and Techniques Applied to the Fields of Farm Management and Land Economics.** Prerequisite: Ag. 240. (2W) **Blanch**
- 242. Research Methods and Techniques Applied to Marketing.** Prerequisite: Ag. Econ. 240. (2S) **Lamborn**
- 250. Graduate Social Science Seminar.** For graduate students in social sciences. Programs and procedures devised by social science graduate students and department staffs. (1W)

Agricultural Education

L. R. Humpherys, Professor Emeritus

Students preparing to teach vocational agriculture in rural high schools register in the Department of Agricultural Education. In the curriculum planned for training teachers of vocational agriculture, emphasis is given to practical farm experience, a broad background in the major fields of human knowledge, a general training in the several fields of agriculture, and a program of teacher training for youth and adults in the vocation of farming. This curriculum has been planned to meet minimum requirements for the general secondary and vocational agriculture certificates as set forth by the Utah State Board of Education. Counseling service is available to assist students in selecting course work throughout the four years of college work.

Master of Science Degree

An opportunity is offered for research and graduate study in Agricultural Education through any of the major departments in the School of Agriculture. Students planning to do graduate work should select a coordinated program of study in the Schools of Agriculture and Education.

PRESCRIBED COURSE OF STUDY FOR MAJORS IN AGRICULTURAL EDUCATION

Institutional and General Requirements

Biological Science:		Cr. Tot.	Language and Arts:		Cr. Tot.
*Botany 24	.....	5	*Landscape Architecture	.....	3
*Zoology 2	.....	5	*Speech, or Music, or		
Zoology 112 (Genetics)	.....	5	*Art or Literature	.....	5 8
*Bacteriology 1 & 2 or 70	.....	5 20			
English:			Social Science:		
Sophomore Composition (10)	5		*Agr. Econ. 53	.....	3
Advanced Composition (110)	4	9	*Sociology 10, or 70 or		
			*Political Science 10, or		
Exact Science:			*Psychology 53, or		
*Chemistry 10, 11, 12	.....	15	*History 14	.....	5 8
*Mathematics 34	.....	3			
Radio 21	.....	4 22	Total	.....	67

Basic and Minimum Requirements in Agriculture, Agricultural Engineering, and Education

Animal Industry†		Cr. Tot.	Education		Cr. Tot.
An. Hus. 10	.....	5	Education 112, 113, 114,		
Elective	.....	15 20	125, 126	.....	22
			Psychology 102	.....	5
Plant Industry†			School Health 155	.....	3
Agron. 56 (Soils)	.....	4	Elective	.....	3 33
Elective	.....	16 20			
Agricultural Economics			Total Minimum Requirements		
Ag. Ec. 102, 103, 162	.....	8	For B. S. Degree		
Elective	.....	3 11	Institutional and General	.....	67
			Agriculture	.....	80
Agriculture			Education	.....	33
Elective	.....	9 9	Military Science & P. E.	.....	6
			Total	.....	186
Agricultural Engineering†					
Irrig. 10	.....	4			
Elective	.....	16 20			
Total	.....	80			

112. Principles of Vocational Education. Fundamental principles and practices in general and vocational education. Social and economic bases for vocational education. (3W)

124. Methods of Teaching Farm Mechanics. Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and management, skill requirements, and supervised practice. (3F)

125. Methods of Teaching Agriculture. Fundamental principles and practices of all teaching. Special attention is given to selection, organization, and teaching of subject matter and supervision of agricultural activities on the farm. (5W)

*Courses which meet lower division group requirements.

†Elective courses must be selected from at least two departments.

126. Directed Teaching in Agriculture. Student observation and teaching under supervision in approved local vocational agricultural departments. Student teachers are expected to leave the campus to train in selected high schools of the state for a full teaching program for a period of five or six weeks. (4-8 W or S) **Humpherys**

151. Extension Methods. For prospective home demonstration and county agricultural agents. History, objectives, organization and accomplishments of extension work in the United States. Farm and home problems, youth and adult education, and extension methods receive emphasis. (3F or S) **Staff**

225. Special Problems in Agricultural Education. A consideration of needs of individual upper division and graduate students and special types of service. (1-2; S) **Humpherys**

226. Organization of Adult Instruction. The fundamental principles and techniques in the organization and instruction of adults in farming occupations. (3S) **Humpherys**

Agronomy

D. W. Thorne, D. W. Pittman, D. C. Tingey, H. B. Peterson, Professors; W. H. Bennett, Associate Professor; D. R. McAllister, G. L. Stoker, S. A. Taylor, LeMoyne Wilson, Assistant Professors; Glenn Baird, Golden A. Kilburn, Extension Agronomists; Rex Nielson, Research Instructor; J. W. Carlson, Denton C. Linton, J. L. Haddock, Vern K. Hugie, Wesley Keller, C. W. Lauritzen, M. W. Pedersen, Warren Rasmussen, J. P. Thorne, F. L. Timmons, D. F. Trussell, R. W. Woodward, R. D. Webber, Collaborators in Research, U.S.D.A.

R. J. Evans, D. S. Jennings, Professors Emeritus.

Bachelor of Science Degree in Agronomy

Study and research in Agronomy focus upon problems of crop production and soil conservation in arid regions. The course offerings emphasize the interrelationships of plants, soil, precipitation, and irrigation water in the production of maximum crop yields under a variety of conditions. Four types of majors for the bachelor's degrees are offered within the department: General Agronomy, Soil Conservation, Technical Field Crops, and Technical Soils. In addition, a joint major is offered between the departments of Agronomy and Irrigation and Drainage. This major is termed Irrigation and Soils.

Major in General Agronomy

A major in General Agronomy prepares the student for positions related to the management of soils and the production of field crops. Training in general agronomy is preparatory to civil service positions such as agronomists, conservationists, farm planners, and soil scientists. Many Agronomy majors are also employed in commercial fields such as field men for sugar beet companies, seed companies, fertilizer distributors, and canning companies. Special course outlines have been prepared to train students for such positions. Studies in General Agronomy are also designed to meet needs of students who desire to farm, to be county agricultural agents, or to take field positions related to soils or crop production with various other state and federal agencies. Students majoring in General Agronomy may partially specialize in either crops or soils.

In addition to the general college and School of Agriculture requirements, all majors in General Agronomy are required to take the following courses: Geology 3, Botany 24, 25 and 130, Bact. 1 and 2, Math. 35 and 44, and Agronomy 10, 56, 101, 102, 103, 107, 111, 112, 155.

Major in Soil Conservation

A major in Soil Conservation prepares the student for employment as a specialist in the Soil Conservation Service, the Soil Conservation Division of the

Indian Service, Soil Surveyors, Soil Scientists in the Bureau of Reclamation as well as other positions related to the reclamation and conservation of soil and water resources.

In addition to the general college and School of Agriculture requirements, all majors in Soil Conservation are required to take the following courses: Bact. 1 and 2 or 70, Botany 24, 25 and 120 or 130; Geology 3 and 115; Math. 35 and 44; Irrig. and Dr. 10; and Agronomy 10, 56, 101, 102, 103, 107, 111, 112, 114, 125 and 155. A suggested course outline for Soil Conservation is obtained by substituting the following courses for those marked (*) in the course outline for General Agronomy: Geol. 115, Agronomy 160, C. Eng. 60, C. Eng. 81, C. Eng. 171.

Major in Technical Field Crops

Majors in Technical Field Crops are prepared for graduate work and technical employment in plant breeding, crop production, and seed technology. Students of high scholastic standing with special aptitude in the fundamental sciences who are interested in the plant sciences will find real opportunity in this major.

In addition to the general college requirements, majors in Technical Field Crops will be required to take the following courses: Chem. 3, 4, 5, 121, 122; Math. 99, Bot. 24, 25 and 120 or 130; Bact. 70; Irrig. and Dr. 10; Agron. 56, 101, 102, 103, 107, 109, 111, 112, 114, 131 and 132. A suggested outline of courses may be obtained from the Agronomy Department.

Major in Technical Soils

Majors in Technical Soils are prepared for graduate work and technical employment in research, soil testing, land classification, and soil management. Students of high scholastic standing with marked ability in the fundamental sciences will find real opportunities in this major.

In addition to the general college requirements, students in Technical Soils will be required to take the following courses: Chem. 3, 4, 5, 117, 118, 121 and 122; Math. 99; Physics 20, 21 and 22; Geol. 3; Botany 24, 25 and 120; Bact. 70; Irrig. and Dr. 10; Hort. 1; Agron. 56, 101 or 102, 103, 107, 111, 112, 114, 131, 132, 155 and 165. A suggested outline of courses may be obtained from the Agronomy Department.

Major in Irrigation and Soils

This joint major between the departments of Agronomy and Irrigation and Drainage is designed for students who wish to specialize in problems related to the management of land and water in irrigation agriculture without specializing in technical engineering phases of irrigation. Extension specialists, civil service positions, and farm managers represent some of the opportunities in this field.

An outline of courses with further details concerning course requirements and employment opportunities can be obtained from the Department of Agronomy or the Department of Irrigation and Drainage.

Master of Science Degree

The Agronomy Department offers opportunity for study and research toward the Master of Science Degree. A year of graduate study in the department is also accepted by other colleges and universities as a year toward a Ph.D. degree in the field of study pursued. The outline of studies and the research program are designed around the objectives of the individual student. The department, in cooperation with other related departments, is prepared to give strong programs in various phases of plant breeding, crop production, weed control, soil chemistry, soil physics, soil conservation, soil management, and soils and irrigation.

The following courses are acceptable for graduate credit toward the Master of Science Degree in the department: M05, 109, 110, 131, 132, 155, 160, 165 and 170.

The following courses are acceptable for graduate credit toward the Master of Science Degree in departments other than Agronomy: 101, 102, 103, 105, 107, 109, 110, 114, 125, 131, 132, 155, 160, 165, 170.

Doctor of Philosophy Degree

The Agronomy Department in cooperation with a number of related departments is approved for the offering of advanced study and research for the attainment of the degree of Doctor of Philosophy in specialized fields of soil science in relation to irrigation agriculture. More detailed information may be obtained from the department or the Dean of the Graduate School.

A Suggested Course in General Agronomy

FRESHMAN

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Math. 34	3	Math. 35	5	Math. 44	3
Botany 24	5	Botany 25	5	Veg. Crops 1 & 2	4
Poultry 1 & 2	4	Agron. 10	1	Soc. 10	5
Hort. 1	3	Speech or Lit.	5	L. Arch. 3	3
P.E. or M. Sci.	1	P.E. or M. Sci.	1	P.E. or M. Sci.	1
	<hr/> 16		<hr/> 17		<hr/> 16

SOPHOMORE

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Chem. 3	5	Chem. 4	5	Chem. 5	5
Geol. 3	5	Eng. 10	5	Chem. 12	5
Agron. 18	3	An. Hus. 10	5	Agron. 56	4
Irrig. & Dr. 10	4	P.E. or M. Sci.	1	P.E. or M. Sci.	1
P.E. or M. Sci.	1		<hr/> 16	Agr. Econ. 53	3
	<hr/> 18				<hr/> 18

JUNIOR

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Agron. 107	5	Agron. 101	3	Ent. 108	5
Agron. 102	3	Dairy 109	3	Eng. 110	4
Bact. 70	5	Lib. Sci. 106	1	Agr. Econ. 162	3
Agron. 131	3	Agr. Econ. 102	3	Agron. 114	3
	<hr/> 16	Agron. 132	3	*Electives	2
		Physics 6	5		<hr/> 17
			<hr/> 18		

SENIOR

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
*Zool. 112 or		*Agron. 109 or 160	4	Range Mgt. 160	5
Geol. 115	5	Agron. 112	1	Agron. 125	3
Bot. 130	5	Agron. 155	3	Agron. 103	4
Agron. 111	1	*Electives	8	*Agr. Ed. 151	3
Agron. 165	3		<hr/> 16	Electives	2
An. Hus. 110 or 125	3				<hr/> 17
	<hr/> 17				

For a Soil Conservation major substitute the following courses for those marked (*) Geol. 115, Agron. 160, Agron. 110, C. E. 60, C. E. 81, C. E. 171.

Farm Crops

1. General Farm Crops. Introductory course in crop production. Two lectures, one 3-hour lab. (3F, W or S) Staff

4. Commercial Grading. Application of federal standards in the grading of field crops. Two 3-hour labs. (2W) Staff

18. Weeds. Identification of weed seeds and plants, the weed problems in agriculture and methods of control. An assessment is made for field trips. Two lectures, one 3-hour lab. (3F) Tingey

101. Cereal Crops. The classification, history and cultural methods involved in production of cereal crops. Two lectures, one 3-hour lab. (3W or S) Staff

102. Root and Miscellaneous Crops. Sugar beets, potatoes, cotton, tobacco, mangels, and other root crops are studied in detail as to cultural methods, market types, and commercial possibilities. Three lectures. (3F or W) Staff

103. Forage Crops. Alfalfa, clovers, grasses and other farm forages; classification and methods of production, harvesting and storage; meadow and pasture management, are discussed. Attention is given to the place of these crops in rotation, soil conservation, and erosion control. An assessment will be made for field trips. Three lectures, one 3-hour lab. (4F or S) Bennett & Evans

105. Seed Analysis and Testing. Impurities of farm and garden seeds; methods of analysis and testing; the inspection and marketing of seeds. Not given except on application of three or more students. One credit for each 3-hour lab. period. (1 or more credits; F, W or S) Tingey

109. Plant Breeding. The principles and practices of plant breeding, technique and improvement by selection and hybridization. Prerequisite: Zoo. 112. Three lectures, one 3-hour lab. (4W) Tingey

124. Advanced Judging, Grading and Identification. Prerequisites: Agron. 104 and 118. Two 3-hour lab. (2S) Staff

The following five courses include a series of conference courses on technical phases of recent advances in crop production and improvement. Each subject carries two credits and two conferences per week.

- 201. Pastures and Hay.
- 202. Alfalfa.
- 203. Sugar Beets and Potatoes.
- 204. Cereals.
- 205. Weeds.

209. Advanced Plant Breeding. The science and practice of plant breeding. Original papers and lectures. Three lectures. (3S) Tingey

213. Crops Seminar. Current scientific topics in farm crops. Required of all graduate majors. One conference. (1F, W, S) Staff

Soils

56. Introductory Soils. Fundamentals of soils with a brief study of soil fertility and management problems. A beginning course for students in agriculture. Prerequisite: Inorganic Chem. Three lectures, one 3-hour lab. period. (4F, W or S) Staff

57. Introductory Soils Laboratory. Offers credit for the laboratory of Agronomy 56 for students who have had a general soils course without a laboratory. One credit. Given the same time as Agron. 56 laboratories. Staff

58. General Soils. Fundamentals of soils with emphasis on range and forest soil problems. Designed for students in forestry and range management. Prerequisite: Inorganic Chem. (Credit not given for both 56 and 58.) Four lectures, one 3-hour lab. period. (5F or S) Pittman

107. Fertility and Management of Irrigated Soils. Methods and amounts of irrigation water application in relation to soils and crops. Fertilizer selection and usage in relation to irrigation and soil management. The management and reclamation of saline soils. Organic matter maintenance in soils. Prerequisite: Agron. 5. Five lectures. (5F or W) Staff

110. Soil Microbiology. Microorganisms are considered in relation to their roles in soil fertility and organic matter decomposition. Also given as Bacteriology 110. Prerequisites: Bact. 1, 2; Agron. 56; Organic Chem. Two lectures, one 3-hour lab. period. (3W) **Jones**

114. Soil Survey and Land Classification. The influence of environmental factors on soil profile development. Soil and land classification, the methods of mapping soils and the preparation and interpretation of soil type, alkali and land classification maps as related to Utah conditions. Field trips are made to study soil and require special assessments. Prerequisite: Agron. 56 or previous arrangement with instructor. One lecture, two 3-hour lab. periods. (3S) **Wilson**

125. Soil Conservation. Special problems of soil management and land policy in relation to soil conservation. Practice in making use of soil conservation surveys in planning farms on a soil conservation basis. A special assessment will be made for field trips. Prerequisites. Two lectures, one 3-hour lab. period. (3S) **Wilson**

155. Soil and Plant Relations. Plant and soil relationships with respect to physical environment and the availability and absorption of minerals. Laboratory in soil and plant analysis in relation to soil productivity. Prerequisite: Agron. 56. Two lectures, one 3-hour lab. period. (3W) **Staff**

160. Genesis and Morphology of Soil. Soil development as influenced by parent material, climate, time, vegetation and topography. Relationship between the soil groups and their use in agriculture. Course for advanced undergraduates and graduate student. Three lectures. (3W) **Staff**

165. Physical Edaphology. The physical relationships of soil moisture, temperature, penetrability, and aeration to plant growth will be given primary consideration. Mineralogical composition, structural conditions, tillage, irrigation and other soil management practices will be considered as factors that affect these relationships. Prerequisites: General Soils, General Physics or Chemistry, or approval of the instructor. Three lectures. (3F) **Taylor**

166. Physical Analysis of Soils. A laboratory course in Soil Physics. Registration limited to twelve students. Prerequisite, Agron. 165, two 3-hour lab. periods. (2W) **Taylor**

170. Special Soil Management Problems. The application of theory in the solution of practical soil management problems. For senior students in Agronomy. Two conferences. (2W) **Staff**

214. Soil Physics. A theoretical discussion of soil as a physical body. The structure of clay minerals and their relationship to absorption and other surface phenomena; soil moisture and air relationships; and soil stabilization will be considered. Prerequisites: Agronomy 165, Math. 122, Physics 154, or approval of the instructor. Three lectures. (3S) **Taylor**

212. Seminar. Review of current literature in soil science. Required of graduate students in soil science; open to staff members. One credit per quarter, one conference. (1F, W, S) **Staff**

The following seven courses include a series of conference courses on technical phases of recent advances in the separate fields of soil science. Open to graduate students in Agronomy or to other graduate students with proper qualifications by special permission. Each subject carries two conferences per week and two credits.

- 219. Saline and Alkali Soils.
- 220. Range and Forest Soil Problems.
- 221. Soil Classification.
- 222. Genesis and Morphology of Soils.
- 223. Soil Conservation.
- 224. Soil Chemistry.
- 225. Soil Physics.

227. Modern Techniques in Soil Research. Reading and discussion in theory and practice in the use of recently developed field and laboratory equipment used in research in the field of soils. Laboratory practice is given in the direct operation of equipment discussed and in the interpretation of data obtained. Two lectures, one 3-hour lab. period. (3W) **Staff**

Special Courses

10. Professional Agronomy. Discussion of agronomic fields. Planning the educational program for a professional agronomist. Required of all freshmen in Agronomy. One lecture. (1W) **Staff**

111, 112. Agronomy Seminar. Review and discussion of current agronomic problems and practices. Required of all seniors in department. One lecture. (1F, W) **Staff**

116. Dry Farming. Principles of dry farming from practical and scientific standpoints; a survey of agricultural work in the Great Plains and the Mountain regions; and analysis of the possibilities in typical climatic areas, and on important soil types. Two lectures. (2S) **Pittman**

117. Geography of Agriculture. A brief review of the fundamental principles of climatic controls. The principal agricultural regions of the world are studied, with topography, climate, soils, crops, livestock, population and industries considered in relation to agriculture. Three lectures. (3W) **Pittman**

131, 132. Applied Statistics. Application of statistical methods to research. Sample-based inferences about populations. Individual and group comparisons. Tests of significance. Linear regression and correlation. Analysis of variance and covariance. Multiple regression. Individual degrees of freedom. Prerequisite: Math. 35 or equivalent. Three lectures. (3F, W) **Crandall**

150. Special Problems. Subject and credit arranged. Conferences or laboratory investigations. **Staff**

215. Design of Experiments. Fundamental principles of experimental designs. Completely randomized blocks, and latin squares. Components of error. Confounding. Factorial, split plot and incomplete block designs. Fractional replication. Prerequisite: Agron. 131 and 132. Three lectures. (3S) **Crandall**

218. Special Problems. Special problems in crop production, crop breeding, soil fertility or other phases of agronomic work are investigated. Students review literature on the problem and conduct experiments in the laboratory or on field plots. Any quarter. Time and credit arranged. **Staff**

230. Research and Thesis. Outlining and conducting research in soils or farm crops and preparation of thesis. Any quarter. One or more credits each quarter. **Staff**

250, 251, 252. Advanced studies under plan "B". Special library and seminar problems or studies designed to meet requirements for reports under plan "B". For details regarding nature and selection of subject matter, limitation of credits and types of reports see Graduate School. 2-5 credits each quarter. **Staff**

Animal Husbandry

L. L. Madsen, A. C. Esplin, G. R. Henderson, Professors; **L. E. Harris,** Associate Professor; **J. A. Bennett, M. A. Madsen, M. Broadbent, H. Steffen,** Assistant Professors; **D. O. Williamson,** Research Instructor.

Students majoring in Animal Husbandry are expected to complete 32 credits in this field, and to include courses Nos. 1, 2, 10, 40, 110, 125, 150, 155, 160 and 165.

For students who plan to take up livestock production, county agent work, vocational agricultural teaching or some similar field of work, a minor in Agricultural Economics, Agronomy, Dairy Husbandry, Poultry Husbandry or Range Management is recommended.

Graduate work leading toward the master of science degree is offered in animal breeding, nutrition, and production. Courses numbered 200 and above are designated for graduate students. Courses 110, 120, 125, 150 and 155 may be used for credit by graduate majors in related departments and by graduate majors in Animal Husbandry by permission of the department chairman.

Prescribed Course of Study for Majors in Animal Husbandry

Freshman

Course	Credit
A. H. 1 and 2, 40	6
M.S. or P.E.	3
Math. 34 or 35	3 or 5
Bot. 24 or 25	5
Bact. 1 and 2	5
Ag. Ec. 53	3
Soc. 10 or 70, or Pol. Sci. 10 or Hist. 14	5
Speech 1 or 5	5 or 3
Vet. Sci. 20	3
Electives	8 to 12
Total	48

Sophomore

Course	Credit
A. H. 10	5
M.S. or P.E.	3
Chemistry 10, 11, 12 or 3, 4, and 5	15
English 10	5
Zoo. 3 and 4 or 2	10 or 5
Hort. or Veg. Crops	3
Agron. 56	4
Language and Arts	3
Electives	0 to 5
Total	48

Juniors

Course	Credit
A.H. 110, 125, 165	9
Dairy 109 or 110	3 or 5
Agron. 101 and 102 or 107	6 or 8
Ag. Ec. 102, 103	5
Vet. Sci. 120	4
Zoo. 112	5
English 110	4
Electives	5 to 9
Total	45

Seniors

Course	Credit
A. H. 150, 155, 160	12
Ag. Ec. 116 or 162	3
Range Mgt. 160	5
Agron. 103	4
Vet. Sci. 140	5
Electives	16
Total	45

1. Fundamentals of Animal Husbandry. Planned to give an understanding of livestock production in relation to other phases of agriculture in the United States and Utah, the influence of geographical location and conditions upon livestock production, the various types of farm animals and the functions performed or products produced, and an introduction to the important factors in the successful production of livestock. (3F or S) **Steffen**

2. Animal Husbandry Laboratory. Laboratory exercises in judging, market classification and practical problems. Should be taken at the same time as A.H. 1. Two lab. periods. (2F or S) **Steffen**

10. Feeds and Feeding. Differences in digestive tracts of farm animals and the physiology of digestion and feed utilization, the composition of feeds, the balancing of rations, and a discussion of feeding of farm animals. Four lectures, one lab. (5 W or S) **Harris**

15. General Animal Breeding. For students who do not expect to major in animal science but who want a general knowledge of reproduction and the breeding principles and their application to larger farm animals. (3F or W) **Bennett**

20. Fur Farming. Breeding, feeding, diseases, management and marketing of furs of the various domestic fur animals, especially foxes, minks and rabbits. (2W) **Harris and Miner**

40. Fitting and Showing Livestock. Current methods of fitting and training livestock for showing. Each student prepares and exhibits animals in a showing contest. May be repeated. (1F or S) **Bennett**

110. Beef Production. Factors involved in economical production of beef cattle, including organization of the enterprise, breeds of beef cattle, selection of suitable breeding stock, production of maximum calf crop, handling and feeding of animals of different ages on the range and in the feed lot, and the marketing of surplus stock. Prerequisite: A. H. 10. (3F or W) **Bennett**

115. Horse Production. Factors involved in economical production and use of draft and light horses, including breeds of horses, breaking and training,

feeding, breeding, housing, handling and marketing. Prerequisite: A. H. 10. (2W) **Steffen**

120. Swine Production. Systems of production with emphasis on those suited to western conditions, breeds of swine, management and feeding of the breeding herd, and feeding for market. The relation of the industry to dairy farming. Prerequisite: A. H. 10. (2W) **Bennett**

125. Sheep Production. Range and farm sheep, with emphasis on range production. Methods of production of lambs and wool, grading and marketing practices, feeding and studies of the breeds of sheep and their adaption to the different husbandry practices. Prerequisite: A. H. 10. (3W or S) **M. A. Madsen**

150. Animal Nutrition. Attention is given fundamental phases of animal nutrition, including protein, carbohydrate, fat and mineral metabolism, vitamins, content and deficiencies of range forage, and feed and forage poisoning. Prerequisites: Chem. 10, 11, 12 (or equivalent), and An. Hus. 10. (4F) **L. L. Madsen**

151, 251. Nutritional Diseases. Special consideration will be given to cause, detection, treatment and prevention of the major nutritional diseases of laboratory and farm animals. Prerequisite: An. Hus. 150. (3W) **L. L. Madsen**

155. Animal Breeding. Application of genetics to improvement of farm animals. Breeding systems, inheritance problems, fertility and sterility in larger farm animals are emphasized. Prerequisites: Vet. Sci. 20, Zool. 112. Four lectures, one lab. (5S) **Bennett**

160. Livestock Production Problems. Attention is given various problems in livestock production, particularly in Utah. Students are expected to apply knowledge acquired in previous courses in the solution of problems they will face in the field after graduation. Prerequisites: A. H. 110 and 125. (3W or S) **Steffen**

165. Livestock Judging and Selection. Animal form and its relation to function. Emphasis on evaluation of live animals in terms of their probable value for production of meat, wool or work. Emphasis on judging for both commercial and show ring purposes. The Livestock Judging Team is selected from among students taking this course. Prerequisite: A.H. 2. Three labs. (3F or S). **M. A. Madsen**

175, 275. Wool Technology. Marketing and manufacturing of wool, and the laboratory techniques used in the study of wool. Methods of grading, scouring, and measuring length, diameter, crimp, density, tensile strength and other characteristics are included. Prerequisite: A. H. 125. (3W) **M. A. Madsen**

185. Meats. Selecting and slaughtering beef, sheep and swine, including grading, cutting, curing, canning and freezing meats for storage. Two lectures, one lab. (Not given 1950)

201. Problems in Animal Breeding. Special assignments, reports and discussions. Students review literature in various phases of animal breeding, and prepare a comprehensive and critical review of at least one phase of the subject. Prerequisite: A. H. 155. (2-6 F, W or S) **Bennett**

210. Problems in Animal Nutrition. Same as A.H. 201, except work is in animal nutrition. Prerequisites: A.H. 150, 151. (2-6 F, W or S) **L. L. Madsen & Harris**

215. Nutrition Laboratory. Review and practice in techniques used in nutrition research. Two labs. (2F or W) May be repeated. **L. L. Madsen & Harris**

220. Problems in Animal Production. Same as A.H. 201, except work is in animal production. Prerequisite: A.H. 160. (2-6 F, W or S) **Bennett & M. A. Madsen**

230. Animal Breeding Research. Students outline a research problem in some phase of animal breeding, making a critical review of pertinent literature, collect, analyze necessary data and prepare a report of the work done. This work may be the thesis material for the M.S. degree, or may be done for graduate credit apart from the thesis. (2-5 F, W or S) **Bennett**

240. Animal Nutrition Research. Same as A.H. 231, except that research is in some phase of animal nutrition. (2-5 F, W or S) **L. L. Madsen and Harris**

250. Animal Production Research. Same as A.H. 230, except that research is in some phase of animal production aside from breeding or nutritional problems. (2-5 F, W or S) **Bennett and M. A. Madsen**

261, 262, 263. Animal Industry Seminar. Topics of current interest and research problems are presented by graduate students, staff members and guest speakers. Subjects discussions relate to nutrition, breeding, and production during Fall, Winter and Spring, respectively. (May be repeated). (1F, W, S)
Staff

Bacteriology and Public Health

Administered jointly by the School of Agriculture
and the School of Arts and Sciences

W. Whitney Smith, W. B. Preston, Kenneth R. Stevens, Professors; **John H. Carlquist,** Special Professor; **L. W. Jones,** Associate Professor; **Ann Burns,** Instructor; **Russell Fraser,** Special Instructor; **K. M. Budge, P. H. Krumpman,** Temporary Instructors.

J. E. Greaves, Professor Emeritus.

Bachelor of Science Degree

Bacteriology majors in Specialized Agriculture (see page 69) should take Bacteriology 1 and 2 or 70, 104, 105, 110, 120, 160, 180, 191, 192, 193; Botany 24, 25; Chemistry 10, 11, 12, 190; Mathematics 34 or 35; Physiology 4; Physics 6 and 7; Zoology 2 or 3 and 4; Public Health 50.

Bacteriology majors in Technical Agriculture (see page 70) should take: Bacteriology 70, 104, 105, 110, 120, 160, 180, 191, 192, 193; Botany 24, 25, 130; Chemistry 3, 4, 5, 117, 118, 121, 122, 191; Mathematics 35, 44; Physics 20, 21, 22; Zoology 3, 4, and 116; Library Science 106.

See Bacteriology and Public Health in the School of Arts and Sciences for other degree offerings.

See pages and for courses that may satisfy group requirements.

Master of Science Degree

Research and graduate courses in the various specialized fields, with strong support from related departments and agencies. Courses numbered 200 and above are designed for graduate students. Courses 102, 110, 120, 131, 144, 162, 164, 166, 167, 170 and 180 may be used for credit by graduate majors in Bacteriology. These courses and the following—104, 105, 140, 141, 142, 143, 156, 160 and 167—may be modified and used for credit by graduate students in related departments.

BACTERIOLOGY

1. Elementary Bacteriology. Basic concepts and practical applications of bacteriology. (4 F, W or S) **Greaves, Stevens**

2. Elementary Bacteriology Laboratory. Basic techniques of the laboratory. Prerequisite: Bact. 1. (1 F, W, or S) **Krumpman**

3. Bacteriological Demonstration. Basic techniques and fundamentals. Prerequisite: Bact. 1. One 1-hour period. Not acceptable as prerequisite to advanced laboratory courses. (1: Not offered 1950-51)

70. General Bacteriology. Intensive treatment of fundamental principles of microorganisms. For majors in science departments. Prerequisite: college chemistry. Four lectures, 1 lab. (5 F, W or S) **Smith, Krumpman**

101. Systematic Bacteriology. Classification relationships. Prerequisite: Bact. 1 or 70. Two lectures. (2) (Not offered 1950-51) **Smith**

102. Determinative Bacteriology. Isolation and identification studies. Prerequisites: At least two laboratory courses in bacteriology. Two labs. (2) (Not offered 1950-51)

104. Dairy Bacteriology. Microorganisms of milk and dairy products and their relation to production, spoilage, and sanitation procedures. Prerequisite: Bact. 1 or 70. Three lectures. (3 S) **Jones**

105. Dairy Bacteriology Laboratory. Experiments to demonstrate the fundamentals. Two labs. Prerequisites: Bact. 1 and 2 or 70. (2 S) **Jones**

110-210. Soil Microbiology. Relationships of microorganisms to processes of soil fertility. Prerequisites: Bact. 1 and 2 or 70. Two lectures, 1 lab. (3 W) **Jones**

120. Food Microbiology. Problems, factors, and principles involved in food production, preservation, spoilage, and poisoning. Prerequisites: Bact. 1 and 2 or 70. Organic Chemistry. Three lectures and two labs. (5 F) **Stevens**

131. Clinical Laboratory Methods. Discussion and practical experiments in the diagnosis of disease. Prerequisites: Bact. 1 and 2 or 70. Organic Chemistry. (5 S) **Budge**

133, 134, 135. Applied Medical Technology. A practical course in laboratory work, performed under close supervision, following the approximate general schedule below:

Clinical Bacteriology and Serology	2 months	Carlquist
Clinical Biochemistry	3 months	Carlquist
Clinical Hematology	1 month	Carlquist
Pathological Tissue Methods	3 months	Carlquist
Blood Bank Procedures	2 months	Carlquist
Electrocardiograph and Basal Metabolism Procedures		
(13 F, W, S)		Carlquist

136. General Pathology Discussions. (2 F) **Carlquist**

137. Clinical Laboratory Methods Discussion (2 W) **Carlquist**

138. Blood Bank and Blood Serology Techniques. (1 S) **Carlquist**

139. Pathological Conference. (1 S) **Staff**

140. Standard Methods of Analysis. The techniques and significance of the standard tests of water and sewage. Prerequisites: Bact. 2 or 70, Organic Chemistry. (3 W) **Stevens**

160. Pathogenic Bacteriology. The properties and characteristics of pathogenic microorganisms and their relationship to the cause, prevention, and control of infectious diseases. Prerequisites: At least two laboratory courses in Bact. Three lectures, two labs. (5 F) **Smith, Budge**

162. Viruses. The major characteristics of viruses and virus diseases. Prerequisite: Bact. 160. (2) (Not offered 1950-51) **Jones**

164. Pathogenic Molds and Yeasts. The culture and identification of the principal fungi, pathogenic for man and animals. (2) (Not offered 1950-51)

166. Immunology. Host resistance to infection. Prerequisite: Bact. 1 or 70. (2 W) **Greaves**

167. Serological Methods. Antigen-antibody reactions in the diagnosis of disease and in the identification of bacteria. Prerequisite: Bact. 2 or 70. (3 F) (Not offered 1950-51) **Budge**

170. Industrial Bacteriology. The role of microorganisms in industrial processes. Prerequisites: Bact. 2 or 70, Organic Chemistry. (3) (Not offered 1950-51)

180-280. Metabolism of Bacteria. The chemistry and physiology of bacterial cells. Prerequisites: Bact. 1 or 70, Organic Chemistry. Four lectures. (4 F) **Jones**

190. History of Bacteriology. The men and discoveries that led to modern bacteriology. Prerequisite: Bact. 1 or 70. (2) (Not offered 1950-51)

191, 192, 193. Proseminar. Prerequisites: Bact. 1 or 70, senior status. (1 F, W, S) **Staff**

194, 195, 196. Bacteriological Problems. Closely supervised library or laboratory study in a selected problem in bacteriology. Prerequisite: Two laboratory courses in bacteriology. Sixty-six clock hours per term. (2 F, W, S) **Staff**

291, 292, 293. Seminar. Prerequisite: Graduate status and approval of department chairman. (1 F, W, S) **Staff**

294, 295, 296. Advanced Bacteriology Problems. Special assignments, reports and discussions. Review of literature of various phases of bacteriology and preparation of a comprehensive and critical review. (Time and credit arranged) **Smith, Stevens, Jones**

299. Research and Thesis. Students outline a research problem in some phase of bacteriology, make a critical review of pertinent literature, collect and analyze necessary data and prepare a report of the work done. This work may be the thesis material for the M. S. degree, or may be done for graduate credit apart from the thesis. (Time and credit arranged) **Smith, Stevens, Jones**

PUBLIC HEALTH

15. Personal Health. Health problems of college students, especially designed for freshmen and sophomores. No prerequisite. (3 F, W or S)
Ethelyn O. Greaves, Don C. Carter, and W. Whitney Smith teach each section.

50. Elementary Public Health. Communicable and non-communicable diseases of general community significance. The function and organization of health departments. No prerequisites. Does not satisfy the biological science group requirements. (3 F or S) **Jones**

140. Standard Methods of Water Analysis. (See Bact. 140)

141. Control of Communicable Disease. Mechanisms of transmission, prevention, and control of the more common contagious diseases. Prerequisite: P. H. 50, Bact. 1. (3) (Not offered 1950-51) **Smith**

142. Non-communicable diseases of Public Health Significance. The common causes of death and disease other than the communicable diseases. Prerequisite: P. H. 50. (3 W) **Smith**

143. Public Health Administration and Organization. The organization and functioning of official and non-official health agencies in the fields of maternal, infant, pre-school, school and adult hygiene in the light of modern trends and present social needs. Local health problems, especially rural problems. Prerequisite: P. H. 50. (3) (Not offered 1950-51) **Stevens**

144. Sanitation and Public Health. Biological background of sanitation. Control of environmental problems, especially those of the rural area. Prerequisite: P. H. 50. (3 S) **Stevens**

155. School Health. The practical needs in health and health training in the school. Methods and materials in health training and instruction. (Meets state certification requirements in health education. (3 F, W, S or Su) **Smith, Stevens, Budge**

156. Health Curricula, Methods, and Materials. The content, method and materials in the teaching of health in secondary and elementary schools. Prerequisite: P. H. 155. (3 S) **Smith**

159. Public Health Laboratory Methods. Practical experience in the special and routine practices of the Public Health Laboratory. Three to fifteen credits any quarter as arranged. **Fraser and Smith**

160. Pathogenic Bacteriology. (See Bacteriology 160)

162. Viruses. (See Bacteriology 162)

164. Pathogenic Molds and Yeasts. (See Bacteriology 164)

166. Immunology. (See Bacteriology 166)

167. Serological Methods. (See Bacteriology 167)

254, 255, 256. Advanced Public Health Problems. Special assignments, reports and discussions. Review literature of various phases of public health and preparation of a comprehensive and critical review. (Time and credit arranged.) **Smith**

Botany and Plant Pathology

Administered jointly by the School of Agriculture
and the School of Arts and Sciences

B. L. Richards, F. B. Wann, Professors; **W. S. Boyle**, Associate Professor; **George W. Cochran**, Associate Research Professor; **Arthur H. Holmgren**, Assistant Professor and Curator of the Intermountain Herbarium; **R. A. Bush**, Instructor; **Bassett Maguire**, Curator New York Botanical Garden, Non-Resident Professor; **Orson S. Cannon**, **Byrce N. Wadley** and **George Kaleostian**, Collaborators, U. S. Department of Agriculture.

Bachelor of Science Degree in Botany

Course requirement for a major: 24, 25, 30, 116, 117, 120, 130, 150.

Course requirement for a teaching major: 24, 25, 30, 120, 130.

Recommended additional courses for specialized fields: Pathology: 121, 131, 135, 151; Taxonomy: 104, 108, 112; Physiology: 121, 224, 228; Cytology 118.

See pages 47 and 48 for courses that may satisfy group requirements.

Master of Science Degree in Botany

The Department of Botany offers opportunity for research and graduate study leading to a Master of Science Degree in the following specialized fields: Pathology, taxonomy, physiology and cytology. The research and graduate possibilities in these fields are greatly augmented through the cooperation of the United States Department of Agriculture and the Intermountain Herbarium.

The following courses may be used for graduate credit by students majoring in the Department of Botany: 104, 118, 121, 135, 151.

The following courses may be modified and used for graduate credit for students in other departments: 104, 117, 118, 120, 121, 130, 131, 150, 151.

1. Principles of Biology. Basic life principles as illustrated in both plant and animal forms. For lower division students except those who may elect Bot. 24, 25 or Zool. 3 and 5. (5F)

Staff

24. Elementary Botany. An introduction to the structure, physiology and reproduction of flowering plants. Consideration given basic structure and functions of cells, tissues, stems, roots, leaves, flowers, fruits and seeds. Three lectures, two laboratory periods. (5F or S)

Boyle

25. Elementary Botany. A survey of the plant kingdom. Emphasis on comparative morphology and reproductive processes of representatives of the major groups of plants. An introduction to the classification of vascular plants is given toward the end. Three lectures, two labs. (5W)

Boyle

30. Taxonomy of Vascular Plants. The kinds, relationships, and classifications of vascular plants, chiefly of this region. Assumes a knowledge of the fundamental principles of botany. Two lectures, two labs. (5S)

Holmgren

104. Taxonomy of Poisonous Plants. The kinds, relationships, and classifications of poisonous plants, chiefly of this region. Assumes a knowledge of the fundamental principles of botany. (2W)

Holmgren

108. Agrostology. A taxonomic study of native and imported grasses of the western ranges. Special attention to species important in grazing and soil binding. Assumes a knowledge of the fundamental principles of botany. (4W)

Holmgren

112. Aquatic and Marsh Plants. A taxonomic and ecological study of aquatic and marsh plants with emphasis on important food and cover plants for wildlife. Assumes a knowledge of the fundamental principles of botany. (3F)

Holmgren

116. Microtechnique. Principles and methods in the preparation of plant materials for microscopic study. Assumes a knowledge of the fundamental principles of botany. (4W)

Boyle

117. Anatomy. Structure and development of major cell types and tissues; comparative anatomy of the stem, root, and leaf of seed bearing plants. Assumes a knowledge of the fundamental principles of botany. (4S) **Boyle**

118. Cytology. A detailed study of the cell with emphasis on structure and behavior of the chromosomes and their bearing on genetics, reproduction, and evolution. Assumes a knowledge of the fundamental principles of botany or zoology. (4S) (Not given in 1951) **Boyle**

120. Elementary Plant Physiology. Fundamental principles of absorption, mineral nutrition, food manufacture, metabolism, translocation, and growth. Assumes a knowledge of the fundamental principles of botany. Prerequisites: Chem. 12 or 121. (5W or S) **Wann**

121. Water Relations of Native Plants. Consideration of rooting habits, sap concentration, transpiration and water requirements of native plants in relation to distribution and adaptation to environment. Prerequisite: Bot. 120. (3W) **Wann**

130. Principles of Plant Pathology. Fundamental principles underlying disease in plants. The types of diseases and methods of study are such as give the student a comprehensive view of Plant Pathology. Assumes a knowledge of botany fundamentals. (5F or S) **Richards**

131. Principles of Plant Disease Control. Fundamental principles underlying disease control practices for all cultivated crops. Prerequisite: Bot. 130 (3S) **Richards**

135. General Virology. Biological, physical and chemical properties of viruses. Designed to provide a basis for study of virus diseases. Prerequisites: Bot. 130 or Bact. 160. (3W) (Not given in 1951) **Richards**

140. Forest Pathology. Nature, cause and control of diseases affecting forest trees. Factors inducing loss in forest products are emphasized. Prerequisites: Bot. 24, 25. (4W) **Richards**

150. Mycology. Comparative morphology and the nuclear behavior of the Phymycetes and the Ascomycetes. Special attention given forms important in agriculture, medicine, and industry. Prerequisite Bot. 25. (4 F) **Richards**

151. Mycology. Continuation of 150 dealing with the Basidiomycetes and the Fungi Imperfectii. Prerequisite Bot. 25. (4 W) **Richards**

160, 161, 162. Laboratory Methods. Open to qualified senior and graduate students majoring in Botany. (1F, W or S) Graduate credit may be obtained by registering for 260, 261, 262. (1F, W, S) **Staff**

221, 222, 223. Pathological Techniques. Special methods as applied to plant pathology, physiology, and related subjects. Registration only by special permission. (2F, W, S) **Staff**

224. Advanced Plant Physiology. Chemical reactions and transformations underlying the vital processes in plants. Prerequisite: Bot. 120. (3S) **Wann**

228. Physiogenic Diseases in Plants. Diseases in plants caused by chemical and physical factors in the environment. (3S) (Not given in 1951) **Wann**

234, 235, 236. Special Problems. Open to qualified students majoring in pathology, taxonomy, plant physiology, or cytology. (2-F, W, S) **Staff**

240, 241, 242. General Botany Seminar. (1-2F, W, S) **Staff**

243, 244, 245. Pathology Seminar. (1F, W, S) **Staff**

250, 251, 252. Research.* Open to all qualified college students in botany and plant pathology. Any quarter. Time and credit arranged. **Staff**

Plant Ecology. (See Range Management 126)

Principles of Genetics. (See Zoology 112)

Dairy Industry

G. B. Caine, A. J. Morris, Professors; G. Q. Bateman, P. B. Larsen, Lloyd R. Hunsaker, Associate Professors; Lyman R. Rich, Associate Professor Extension Dairyman.

Students majoring in Dairy Production must complete the following major courses for graduation: Dairy 3 and 6; An. Hus. 150, 155, and all courses in Dairy Production 109, 110, 111, 112, 120; Chem. 107 and Bact. 104 are also required.

There is demand in the technical field of dairying for students who have had advanced training.

An opportunity is offered to do graduate work with an application in the field of chemistry, biochemistry, genetics, bacteriology or economics.

1. General Dairy Husbandry. A short general course considering history and present status of the dairy industry; starting dairy herds; breeds of dairy cattle; cow testing associations; club work; study of herd records; calf feeding; general principles of feeding, management and housing of dairy cattle. Lab., Judging dairy cattle. (3F, W or S) **Caine**

3. Principles of Dairy Industry. A study of the history and development of the dairy industry; composition and secretion of milk; the use and operation of the separator and Babcock test; dairy arithmetic; and a brief preview of market milk, butter, cheese, and ice cream. (3W) **Larsen**

5. Judging Dairy Products. Methods and practice in judging and grading dairy products for market and show. (2S) **Larsen**

6. Market Milk. Modern, sanitary methods of producing, processing, and marketing milk, cream, and related products for city supply. (5F) **Larsen**

7. Dairy Practice. For special or short course students only. Practice in plant manufacture emphasized. Any quarter. Time and credit arranged. **Morris**

12. Breeds of Dairy Cattle. Study of history and development of all breeds of dairy cattle; special emphasis on the various families within the breeds; requirements for official testing; pedigree and herd book study. (4F) (Not given in 1950-51) **Caine**

101. Manufacture of Ice Cream and Ices. Purchase of raw materials. Chemical and physical structure of an ice cream mix and its relation to the finished product. Standardizing, processing, and freezing of standard commercial ice creams, sherbets, and ices. Problems in merchandising and selling included. (5S) **Morris**

102. Manufacture of Butter. Receiving and grading of milk and cream. Neutralization and pasteurization of cream. Manufacture, packing, and grading of butter under commercial conditions. Quality and composition control will be emphasized. (5S) **Larsen**

103. Manufacture of Cheese. Factors involved in making Cheddar and other varieties of cheese. Classification, statistics, curing, marketing and factory organization. (5F) **Morris**

104. Concentrated Milks. Theory and practice of manufacture of evaporated, sweetened condensed, milk powder and other concentrated milk products. Consideration is given to plant processes, vacuum pan and drier operation, factors affecting quality and utilization. (5W) **Larsen**

105. Management and Operation of Dairy Manufacturing Plants. Personnel problems, advertising, selling, managerial use of records, and other principles underlying successful management and operation are considered. All operations of the creamery are conducted by this class. Application for admittance must be made in writing. (6F, W or S) **Morris**

109. Dairy Production. A brief review of the dairy industry. The place of dairying in a permanent system of agriculture. Origin of breeds, study of dairy type, brief review of breeds of dairy cattle. Factors to consider in selecting a breed. Selection of cows, systems of record keeping, selection, care, and management of the herd sire. (3W) **Caine**

110. Dairy Production. A brief review of dairy cattle breeding, calf feeding and management, developing dairy heifers, factors influencing the growth and development of dairy cattle, the care and management of dairy herds. Special

emphasis on feeding for milk production. A brief study of metabolism and the characteristics of feeds and feeding standards. A thorough study of housing dairy cattle. Prerequisite: Dairy 109. (5S) **Caine**

111. Dairy Cattle Judging. The types of the various breeds of dairy cattle. Visits to important herds. Valuation of dairy cattle. (2S) **Caine**

112. A Study of Feeding and Management of Dairy Cattle on Irrigated Lands. (3W) **Hunsaker**

115. Seminar. Discussion and reports of current literature. Any Quarter. Time and credit arranged. **Staff**

120. Dairy Cattle Breeding. A study of the inherited characteristics of dairy cattle that should be considered in selecting breeding stock. A brief coverage of artificial insemination of dairy cattle, physiology or reproduction and breeding programs and systems in use. (3W) **Hunsaker**

121. Milk Secretion. A brief review of the mammary gland. Theories of milk secretion and coverage of some management problems related to management—including mastitis control, flavors in milk etc. (3 Su) **Hunsaker**

150. Special Problems in Dairy Production. Any quarter. Time and credit arranged. **Hunsaker, Caine**

154 or 254. Special Problems in Dairy Manufacturing. Any quarter. Time and credit arranged. **Morris, Larsen**

216. Research in Dairy Production. Any quarter. Time and credit arranged. **Caine, Hunsaker**

217. Research in Dairy Manufacturing. Any quarter. Time and credit arranged. **Morris, Larsen**

260, 261, 262. Animal Industry Seminar. Research and current topics of special interest to Dairy Production students. Subjects relating to nutrition, breeding and production. (1F, W, S) **Staff**

GENERAL COURSE IN DAIRY PRODUCTION

Freshman	Credits	Sophomore	Credits
Math. 34 or 35	3-5	Ag. Econ. 53	3
Chemistry 10, 11, 12		Vet. Science 20	3
or 3, 4, 5	15	Bact. 1 & 2 or 70 & 71	5
Dairy 1	3	Botany 24	5
An. Husbandry 1	3	Zoology 2	5
Poultry 1	3	English 10	5
Veg. Crops 1 or Hort. 1	3	Agronomy 56	4
General Farm Crops	3	Dairy 6	5
Sociology 10 or 70 or		Physics 6	5
Political Science 10	5	Electives	5
Speech 1	5		
Dairy 3	3		

45

45-48

Junior & Senior	Credits
Animal Nutrition 150	4
Nutritional Diseases 151	3
Animal Breeding 155	5
Dairy 109	3
Dairy 110	5
Dairy 111	2
Dairy 112	3
Dairy 120	3
Dairy 115	1
Chemistry 107	4
Dairy Bact. 104	3
Animal Hygiene 120	4
Chemistry 125	5
Ag. Econ. 102 & 162	6
Library Science 106	1
English 110	4
Int. Pol. Relations 102	3
Electives	31

GENERAL COURSE IN DAIRY MANUFACTURING

In this course the aim is to fit students for commercial dairying to become plant operators, equipment and supply technicians, inspectors, graders, and sanitarians.

GENERAL COURSE IN DAIRY MANUFACTURING

Freshman	Credits
Math. 34	3
Zoo. 1 or Botany 24	5
Language and Arts	8
Ag. Econ. 53	3
Poultry 1	3
Physiology 4	5
Agronomy 1	3
Social Science	8
Hort. 1 or Veg. Crops 1	3
Electives	4
P. E. or Military	3
	<hr/> 48

Sophomore	Credits
Bacteriology 70	5
Chemistry 10, 11 & 12	15
Dairy 6	5
Speech 5	3
English 4	4
An. Husbandry 1	3
English 10	5
Dairy 5	2
Electives	5
P. E. or Military	3
	<hr/> 50

Junior	Credits
Dairy 103	5
Chemistry 107 & 108	8
Business Adm. 25	5
Ag. Econ. 102	3
Dairy 104	5
English 110	4
Ag. Econ. 162	3
Dairy 101	5
Bacteriology 104-105	5
Electives	6
	<hr/> 49

Senior	Credits
Dairy 115	2
Dairy 154	5
Dairy 105	6
Library Science 106	1
Dairy 102	5
Dairy 110	5
Electives	21
	<hr/> 45

Suggested electives: B.A. 63 & 156; Sociology 70; Dairy 112.

TECHNICAL COURSE IN DAIRY MANUFACTURING

This course is designed to meet the needs of laboratory technicians, investigators, teachers and those who expect to do graduate work.

Freshman	Credits
Math. 35, and 44	8
Zoo. 1 or Botany 24	5
Language & Arts	6
Poultry 1	3
Physiology 4	5
Hort. 1 or Veg. Crops 1	3
Ag. Econ. 53	3
Agronomy 1	3
An. Husbandry 1	3
P. E. or Military	3
Electives	7
	<hr/> 49

Sophomore	Credits
Bacteriology 70	5
Chemistry 3, 4, 5	15
Dairy 6	5
Speech 5	3
Physics 6	5
English 10	5
Dairy 5	2
Electives	5
P.E. or Military	3
	<hr/> 48

Junior	Credits	Senior	Credits
Dairy 115	1	Chemistry 107-108	8
Chemistry 121 & 122	10	Library Science 106	1
Ag. Econ. 102 & 162	6	Dairy 105	6
English 110	4	Dairy 104	5
Social Science	10	Dairy 102	5
Dairy 101	5	Dairy 110	5
Bacteriology 104-105	5	Electives	15
Electives	9		
	<hr/> 50		<hr/> 45

Recommended electives: B.A. 63 & 156; Physics 7; Dairy 115 & 154; English 5; Chemistry 117 & 118.

Horticulture

S. W. Edgecombe, Professor; **R. K. Gerber**, Assistant Professor; **Clarence D. Ashton**, Extension Horticulturist; **Odeal Kirk**, Superintendent, Ogden Substation.

Students may major in general horticulture, floriculture, or pomology. A suggested course for each major is given below.

A Suggested Course in General Horticulture

Freshman

Fall

Courses	Credits
Math. 34 or 35	3-5
P.E. or MST	1
Botany 24	5
Principles of Econ.	3
Hort. 1	3
	<hr/> 15-17

Winter

Courses	Credits
Botany 25	5
Animal Sci.	3-4
Veg. Crops 1	3
Hort. 8	3
P.E. or MST	1
	<hr/> 15-16

Spring

Courses	Credits
Botany 30	5
Animal Science	3
Irr. & Drainage 10	4
Veg. Crops 2	1
Hort. 6	3
P.E. or MST	1
	<hr/> 17

Sophomore

Fall

Chem. 3 or 10	5
Social Science	5
English 10	5
P.E. or MST	1
Electives	1
	<hr/> 17

Winter

Chem. 4 or 11	5
Lang. & Arts	5
Hort. 10	4
P.E. or MST	1
Electives	2
	<hr/> 17

Spring

Chem. 5 or 12	5
Agronomy 56	4
Agronomy 1	3
Hort. 11	3
	<hr/> 15

Junior

Fall

Bact. 70	5
*Hort. 101	3
*Hort. 110	1
Entom. 108	5
Electives	3
	<hr/> 17

Winter

Bot. 120	5
Zool. 112	5
*Hort. 102	3
*Hort. 111	1
Electives	3
	<hr/> 17

Spring

English 110	4
Bot. 130	5
Entom. 120	2
*Hort. 112	1
Electives	5
	<hr/> 17

*These courses taught only in alternate years.

Senior

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
*Hort. 151	4	Veg. Crops 105	4	*Hort. 115	4
Hort. 153	1	or 120	4	Hort. 155	1
Agr. Econ.	3	Hort. 154	1	Lang. & Arts	3
Electives	9	Agr. Econ.	3	Electives	9
	17	Electives	9		17
			17		

This major particularly prepares the student for extension service and similar civil service positions, for fruit growing, and field positions with commercial concerns.

Suggested Course in Floriculture

Freshman

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Hort. 1	3	Hort. 10	4	Hort. 6	3
Bot. 24	5	Bot. 25	5	Bot. 30	5
Princ. Econ.	3	An. Sc.	3-4	I.D. 10	4
Math. 34 or 35	3-5	Veg. Crops 1	3	Veg. Crops 2	1
P.E. or MST	1	P.E. or MST	1	An. Sc.	3
	15-17		16-17	P.E. or MST	1
					17

Sophomore

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Chem. 3 or 10	5	Chem. 4 or 11	5	Chem. 5 or 12	5
English 10	5	L.A.	5	Agron. 56	4
L.A. 3	3	Social Sc.	5	L.A. 41	3
L.A. 40	3	P.E. or MST	1	Hort. 11	3
P.E. or MST	1	Electives	1	P.E. or MST	1
	17		17		16

Junior

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
Bact. 70	5	Botany 120	5	Botany 130	5
*Hort. 116	3	*Hort. 117	3	*Hort. 118	3
Entom. 108	5	Zool. 112	5	Entom. 120	2
Electives	4	Electives	4	English 110	4
	17		17	Electives	3
					17

Senior

Fall		Winter		Spring	
Courses	Credits	Courses	Credits	Courses	Credits
*Hort. 119	3	*Hort. 120	3	Hort. 121	3
Hort. 153	1	Hort. 154	1	Hort. 155	1
Veg. Crops 130	4	Ag. Econ.	3	Ag. Econ.	3
Chem. 125	5	Chem. 126	5	*Hort. 115	4
Electives	4	Electives	5	Electives	6
	17		17		

Students electing this major obtain training which will prepare them for flower production and retail florist opportunities and positions in the floricultural industry.

*Taught only in alternate years.

A Suggested Course in Pomology

Freshman†

Sophomore

Fall

Courses	Credits
Chem. 3 or 10	5
Social Sci.	5
English 10	5
P.E. or MST	1
Electives 1	1
	<hr/> 17

Winter

Courses	Credits
Chem. 4 or 10	5
Lang. & Arts	5
Hort. 10	4
P.E. or MST	1
Electives	2
	<hr/> 17

Spring

Courses	Credits
Chem. 5 or 12	5
Lang. & Arts	3
Agron. 56	4
Agron. 1	3
P.E. or MST	1
	<hr/> 16

Junior

Fall

Bact. 70	5
Ent. 108	5
*Hort. 101	3
*Hort. 110	1
Electives	3
	<hr/> 17

Winter

Botany 120	5
Zool. 112	5
*Hort. 102	3
*Hort. 111	1
Electives	3
	<hr/> 17

Spring

Botany 130	5
English 110	4
Entom. 120	2
*Hort. 112	1
Electives	5
	<hr/> 17

Senior

Fall

*Hort. 151	4
Hort. 153	1
Agr. Econ.	3
Chem. 125	5
Electives	3
	<hr/> 17

Winter

Hort. 154	1
Veg. Crops 105	
or 120	4
Agr. Econ.	3
Chem. 126	5
Electives	4
	<hr/> 17

Spring

Hort. 153	1
*Hort. 115	4
Electives	12
	<hr/> 17

This major is particularly recommended to students who wish to go into fruit production although the training does provide background for positions in the fruit industry.

Major in Technical Floriculture

Majors in technical floriculture are prepared for graduate work in floriculture and technical employment in flower breeding, and floricultural production. Students with high scholastic standing with special aptitude in the fundamental sciences and who are interested in floriculture will find distinct opportunities in this major.

Major in Technical Pomology

Students particularly interested in Pomology with the same aptitudes and scholastic standing as those interested in floriculture will find opportunities in this major, since it will train them for graduate work and technical employment in fruit breeding, and fruit production.

A suggested course outline in technical floriculture or technical pomology may be obtained by requesting the same from the Dept. of Horticulture. Admission to this course is by permission of the Head of the Department and the Dean of Agriculture.

†Freshman year courses are the same as for general Horticulture.

*Taught only in alternate years.

Master of Science Degree

The department offers work towards a Master of Science degree in Horticulture, Floriculture, and Pomology. A year of graduate study in the department is accepted by other colleges and universities as a year toward a Ph.D. degree in the field of study pursued. In all instances, the outline of studies and the research program are designed around the objectives of the individual student.

All courses in horticulture numbered over 100 may be used for graduate credit.

Only General Horticulture 1 may be counted to fill the horticultural requirement for students in the various fields of agriculture.

1. General Horticulture. Principles and practices underlying production of tree fruits, small fruits, flowers, and ornamental plants. Varieties, soils, sites, fertilizers, culture, pest control, harvesting, storage, propagation, and stocks. Designed to give a brief resume of each phase. (3F, W or S) **Edgecombe, Gerber**

6. Plant Propagation. A study of the principles and practices involved in the propagation of horticultural plants. (3S) **Gerber**

8. Small Fruit Production. Principles and practices involved in the culture of small fruit in home and commercial plantings. (3W) **Gerber**

10. Principles and Practices of Floriculture. Fundamental principles and practices involved in the culture of annual and perennial flowers, bulbs, house plants, shade trees, shrubs, lawn grasses and greenhouse plants. (4W) **Edgecombe**

11. Garden Flowers. Principles and practices of growing garden flowers. (3S) **Edgecombe**

101, 102. Advanced Pomology. Principles and practices of orcharding. 101, fruit industry, morphology, flower bud formation, orchard sites and soils, cultural practices, harvesting and storage, varieties, propagation and stocks. 102, fertilizers, spraying, pruning and training, winter injury, nutrition and fruit setting, thinning and alternate bearing, water relations, Hort. 110, 111, 112 are laboratories for these courses and should be taken at the same time. Prerequisites: Bot. 24, 25; Chem. 12 or 121; Agron. 56; Hort. 1 and if possible Hort. 6. (3F, 3W) **Edgecombe, Gerber**

110, 111, 112. Orchard Practice. Laboratories to accompany 101, 102 advanced field work in orchard and small fruit production. Prerequisites: Hort. 1 and if possible Hort. 6 and 8. (1F, 1W, 1S) **Gerber**

115. Advanced Fruit and Ornamental Plant Breeding. Fundamental principles and practices of plant breeding in the improvement of fruit and ornamental plants. Prerequisites: Zool. 112; Hort. 1, and preferably 6, 8, 10. (4S) (Not given in 1950-51) **Edgecombe**

116, 117. Commercial Greenhouse Management. Principles and practices of commercial greenhouse management. Prerequisites: Hort. 1, 6, 10; Bot. 24, 25. Alternate years. (Not offered in 1950-51) (3F, 3W) **Staff**

118. Floral Design. Methods used in making floral displays, wreaths, bouquets, arranging cut flowers. Prerequisites: Hort. 1, 10. Alternate years. (Not given in 1950-51) **Staff**

119, 120, 121. Systematic Floriculture. 119. Systematic study of garden flowers. Prerequisites: Hort. 1, 6, 10; Bot. 30. 120. Systematic study of plants grown by florists. Prerequisites: Hort. 119, 121. Systematic study of conservatory plants. Prerequisites: Hort. 118; Alternate years. (3F, 3W, 3S) **Staff**

151. Systematic Pomology. Systematic study of fruits, origin, classification, identification, judging, adaptation. Alternates with 101. (Not given in 1950-51) (4F) **Edgecombe**

153, 154, 155. Seminar. Oral and written reports on research papers and original work by student. (1F, 1F, 1S) **Staff**

156. Special Problems. Advanced problems in pomology or floriculture for qualified seniors or graduate students. Assigned readings, or research work in library, laboratory or field presented as term papers. Registration by permission only. (1-3F, W or S) **Staff**

201, 202, 203, 204, 205. Research. Original research in pomology or floriculture by graduate students taking a major or minor in horticulture. Registration by permission only. One to ten credits. 201, Fall; 202, Winter; 203, Spring; 204, First Summer Term; 205, Second Summer Term. **Staff**

205. History and Literature of Horticulture. Prerequisite: 20 credits in Horticulture. Origin of horticultural plants and practices. Prehistoric evidences of horticultural operations. Early historic references to arts of gardening. Greek and Roman authors. Development of European and American Literature of Horticulture. (3W) **Edgecombe**

206. Graduate Conference. (1F, W or S) **Edgecombe**

Landscape Architecture and Planning

Administered jointly by the School of Agriculture
and the School of Arts and Sciences

Laval S. Morris, Professor; **Kenji Shiozawa**, Instructor.

The Department of Landscape Architecture and Planning is concerned with the design and development of land areas for use in relation to man's needs. Land use is of prime importance in the evolution of a plan or design, and constant endeavor is made to turn out work that is functional.

Communities and regions are studied as social and physical organisms. These organisms are analyzed, observed and put together piece by piece. The residential area or subdivision is studied even more intensively than the individual home; lots and their relation to each other are emphasized. The business and industrial areas, the recreational facilities including parks, circulation and car parking space, airports, cemeteries, civic groups and a great variety of public and private areas are studied in relation to people and their needs.

The most intensive training required in landscape architecture and planning is in design. It is a discipline requiring considerable time and restrained imagination. This type of creative work is neither taught nor learned in the same way most subjects are handled. Plato says of it, "... but, after much communing and constant intercourse with the thing itself, suddenly, like a flame kindled from a running fire, it is born into the soul, and hence-forth nourishes itself." When that time arrives in the life of the student design and intellectual pleasure are as one with each other.

Students spending their first year at a junior college, or other institution, should take among other things, mathematics through trigonometry, freshman English, sociology and art.

3. Elements of Landscape Architecture and Planning. Relation of people to land; regions and small areas. Principles of design and composition as applied to various types of land planning. The design of home grounds emphasized. Particular value to those wanting a general knowledge of landscape architecture. Field trip required. (3F or S) **Morris**

20. Drawing. A general course in drawing to acquaint students with use of instruments. Necessary to all design courses. Lettering, general drafting, perspective drawing, light and shade studies. (3F or W) **Shiozawa**

30. History and Literature of Landscape Architecture. The history of landscape architecture from antiquity to the present time, its relation to architecture and other allied arts. Present trends and future possibilities are emphasized. (5W) **Morris**

35. Theory of Design. A study of form in relation to vertical mass and horizontal space. Abstract design is studied and the resultant forms transposed into concrete space and mass relationships. The chief purpose is to provide the student with an awareness of design as early in his training as possible. (3W) **Staff**

40, 41. Plant Materials. Classification, identification, ecological requirements and uses of woody and herbaceous plants for landscape purposes. Both native and introduced plants studied. (3F, S) **Shiozawa**

60, 61, 62. Architectural Design. The study and design of architectural structures. Relation of buildings to the land. Integration of roofed and open areas. (2F, W, S) **Shiozawa**

130. Recreational Planning. Public and private recreation in relation to design, construction and operation. National and state parks and forests studied as they pertain to recreation. Field trip required. (2S) **Staff**

135. Travel Course. A major field trip to examine a variety of projects in planning and design. Students are required to take this course at least twice during their training. Time and credit arranged. **Staff**

140, 141, 142. Design. Design of private and public properties based on principles of utility and composition. Prerequisites: L. A. 3, 20; and Civil Eng. 81, 82, 83. (2F, W or S) **Shiozawa**

150, 151, 152. Planting Design. Pictorial compositions and planting plans developed together. Designed to develop the student's ability to visualize the finished landscape. (2F, W, S) **Morris**

160, 161, 162. Landscape Construction. Master construction plans, grading, drainage, sprinkling systems, structures, cost estimates. (3F, W, S) **Staff**

165. Construction Methods and Practice. For students who intend to become contractors or go into maintenance work. Students work in the field on construction projects involving grading, general construction and planting. Registration by permission during summer. Credit arranged. **Staff**

170. Town and City Planning. Gathering and analyzing data for town and city planning. Land use, zoning circulation, recreation, housing. (3F) **Staff**

180, 181, 182. Advanced Planning and Design. Design of subdivisions, housing projects, public grounds, parks, cemeteries, building groups and recreational areas on various types of topography. (3F, W or S) **Morris**

190. Special Problems. Selected problems to meet the needs of individual students for completion of training. Registration by permission only. Any quarter. Time and credit arranged. **Staff**

195. Seminar. Readings and discussions. (1W) **Staff**

210. Advanced Problems in Design and Planning. Time and credit arranged. **Staff**

Poultry Husbandry

C. I. Draper, Lawrence Morris, Professors; A. B. Stevenson, Assistant Professor; Woodrow Jenkins, Extension Specialist.

Byron Alder, Professor Emeritus.

Courses in other departments that can be applied toward a major in Poultry Husbandry are as follows: Animal Husbandry 150, 151 and 155; and Veterinary Science 120 and 170.

The department offers work leading to a Master's Degree in Poultry Husbandry to qualified students.

Credit for the following courses may not be used to meet the requirements for this advanced degree: Poultry Husbandry 101, 102, 104, 127.

1. General Poultry. A study of breeds, judging, incubation, brooding, feeding, marketing, designed to meet the needs of the students wishing a general knowledge of the poultry industry and the problems of production, and a foundation upon which other courses are built. (3F or W) **Staff**

2. General Poultry Laboratory. Covers the same work as Poultry 1 with practical laboratory problems. (1F or W) **Staff**

8. Turkey Production. A study of the breeds, breeding, brooding, feeding, and marketing of turkeys. Special problems involved in small farm flock or large commercial flock management are emphasized. (3W) **Alder**

10. Poultry Practice. Elementary practice at the poultry yards. Prerequisite: Poultry 1. (1F, W or S) **Draper**

101. Poultry Production. A study of poultry production problems, breeds, judging, selection, feeding and management. Poultry Lab. 102 should accompany this course. (3S) **Staff**

102. Poultry Production. Laboratory practice in selection, judging, and other production problems. (1S) **Staff**

104. Incubation and Brooding. This course is designed to familiarize the student with the special problems involved in incubation or hatchery operation and the brooding, feeding and rearing of chicks. The advantages and disadvantages of battery, hot water, electric, coal burning, and gas brooders are emphasized. (2S) **Stephenson**

105. Poultry Management. Problems of location of poultry farm, farm planning, renewing the flock, feeding, disease control, marketing, and other problems affecting labor income are studied in detail. Prerequisite: Poultry 1. (3W) **Staff**

106. Poultry Breeding. Origin and differences among breeds of chickens, the physiology of reproduction, the mechanism of inheritance and the inheritance of discrete and quantitative characters. Consideration is also given to inbreeding, the crosses between inbred lines, and the National Poultry Improvement Plan. Prerequisites: Poul. 1 or 101, Math. 34, and Zoo. 112. (3W) (Not given in 1950-51) **Stephenson**

107. Poultry Feeds and Feeding. A study of nutrition problems, the feeds and methods of feeding. Developing rations for special needs and for farm mixing. Prerequisite: Poul. 1. (3W) **Draper**

110. Poultry Products. Concerned primarily with the formation, structure, composition, processing, grading, storage, and distribution of poultry and poultry products. Industrial uses and proper care and handling of poultry by-products will also receive some consideration. Two lectures, one lab. (3S) **Staff**

125. Special Problems. Special assignment to work out certain information on special problems. Prerequisites: Poul. 1, 104 and 107. Credit arranged. (F, W or S) **Staff**

126. Seminar. Current poultry literature studies; assigned problems and special topics. (1W) **Staff**

127. Advanced Poultry Practice. Special practice at the poultry yards. Prerequisites: Poul. 1, 104 and 107. Time and credit arranged. (F, W or S) **Stephenson and Draper**

Poultry Diseases. (See Veterinary Science 170.)

210. Research Problems in Poultry Nutrition. Time and credit arranged. (2-5) **Staff**

212. Research Problems in Poultry Breeding. Time and credit arranged. (2-5) **Staff**

214. Research Problems in Poultry Production. These problems will be in some phase of poultry production other than breeding or nutrition. Time and credit arranged. (2-5) **Staff**

260. Animal Industry Seminar, Nutrition. (1F) **Staff**

261. Animal Industry Seminar, Breeding. (1W) **Staff**

262. Animal Industry Seminar, Production. (1S) **Staff**

Vegetable Crops

L. H. Pollard, Professor; **E. Milton Andersen**, Associate Professor; **M. P. Leonard**, Superintendent Farmington Substation; **L. R. Hawthorn**, **Alfred E. Clarke**, Collaborators in Research, U.S.D.A.

In addition to the general college and School of Agriculture requirements, students majoring in Vegetable Crops are required to take the following: Vegetable Crops 1, 2, 100, 102, 105, 120, 121, 130, 161, 162, 163; Horticulture 1, 8, 10; Agronomy 56 107; Botany 120 130.

Students who plan to do graduate work may be admitted to the technical

course in Vegetable Crops by permission of the Department Head and the Dean of the School of Agriculture.

The Vegetable Crops Department offers work toward a Master of Science Degree in Vegetable Crop Production and Vegetable Breeding. The following courses may be used for graduate credit: 120 121, 160, 161, 162, 163.

A Suggested Course in Vegetable Crops

Freshman		Sophomore		Junior	
Courses	Credits	Courses	Credits	Courses	Credits
Prin. of Econ. 53.....	3	Chemistry 10, 11, 12		Ag. Econ. 102.....	3
Vegetable Prod. 1.....	3	or 3, 4, 5.....	15	Ag. Econ. 162.....	3
Veg. Prod. Lab. 2.....	1	Speech 1 or.....	5	Agron. 101.....	3
Math. 34.....	3	Speech 5.....	3	Agron. 107.....	5
Math. 35.....	5	English 10.....	5	Genetics 112.....	5
Botany 24.....	5	Hort. 8.....	3	Eng. 110.....	4
Botany 25.....	5	Dairy 1.....	3	Veg. Crops 105.....	4
Social Sci.....	5	Gen. Poultry 1 & 2.....	4	Veg. Crops 130.....	4
Gen. Hort. 1.....	3	Agronomy 56.....	4	Hort. 10.....	4
Gen. Agronomy 1.....	3	Landscape Arch. 3.....	3	Botany 120.....	5
Gen. Bacteriology 1, 2.....	5	Geology 3.....	5	Electives.....	11
Gen. An. Hus., 1 & 2.....	5	Electives.....	4 or 6		
Electives.....	5				51
	51		51		

Senior		Suggested Electives	
Courses	Credits	Courses	Credits
Agronomy 155.....	3	Math. 46.....	5
Agronomy 131.....	3	Physics 6, 7 or.....	10
Agronomy 132.....	3	Physics 20, 21, 22.....	15
Agronomy 109.....	4	Horticulture 101.....	3
Veg. Crops 120.....	4	Horticulture 102.....	3
Veg. Crops 121.....	4	Vegetable Crops 140.....	4
Veg. Crops 100.....	2	Vegetable Crops 160.....	1-6
Veg. Crops 102.....	2	Photography 63 or 163.....	5
Veg. Crops 161, 162, 163.....	3	Irrigation and Drainage 10.....	4
Botany 121.....	3		
Botany 130.....	5		
Entomology 108.....	5		
Electives.....	10		
	51		

1. Vegetable Production. The methods of production, harvesting, storage, and processing of vegetables. (3F, W or S) **Pollard and Andersen**

2. Vegetable Production Laboratory. Designed to give practical experience in vegetable production. Field trips are taken to important production areas and vegetable processing plants. (1F or S) **Pollard and Andersen**

100, 102. Vegetable Practice. Laboratory designed to give students fundamental training in field of vegetable production. (2F, 2S) **Staff**

105. Major Vegetable Crops. Classification, identification, origin, history, types, and uses of the vegetable crop plants. Special emphasis given crops of major importance in Utah. Alternates with 121. Prerequisite: Veg. Crops 1. (4) (Not given in 1950-51) **Pollard and Andersen**

120. Vegetable Improvement. Fundamental principles and practices of plant breeding in the improvement of vegetables. Prerequisite: Agron. 109. (4S) **Pollard**

121. Advanced Vegetable Crops. Economic, ecological and physiological factors underlying vegetable production, based on a study of experimental

results. Prerequisites: Veg. Crops 1, 105; Agron. 56, Bot. 120. Alternates with 105. (4W) **Andersen**

130. Vegetable and Flower Seed Production. Methods and commercial possibilities of vegetable and flower seed production in Utah. A required field trip is taken into seed producing areas of southern Idaho. (4F) **Pollard and Hawthorn**

140. Vegetable Processing. Methods used in the canning, freezing, dehydrating, and pickling of vegetables. Laboratory exercises are conducted in the processing plant at the Farmington Substation. Field trips are taken to commercial plants. Three lectures, one lab. (4F) (Not given in 1950-51) **Andersen**

160. Special Problems. Any quarter. Time and credit arranged.

161, 162, 163. Seminar. Discussion of current literature. (1F, 1W, 1S) **Staff**

210. Research and Thesis. Original research on vegetable crops and seed production or breeding problems for graduate students taking a major or minor in vegetable crops. Any quarter. One or more credits each quarter. **Staff**

212. Seminar. Discussion and reports of current literature. One credit each quarter. **Staff**

215. Special Problems. Any quarter. Time and credit arranged. **Staff**

Veterinary Science

Wayne Binns, Professor; M. L. Miner, Associate Professor;
H. M. Nielsen, Paul V. Christofferson, Assistant Professors.

Courses in Veterinary Science are designed, not for training specialists in this field, but to complete the instruction of students in Animal Husbandry, Dairy Husbandry, Poultry Husbandry, and Bacteriology. Animal sanitation and disease control are emphasized. Pre-veterinary courses for those wishing later to obtain a veterinary degree elsewhere, may be taken.

20. Anatomy and Physiology of Domestic Animals. The anatomy and physiology of domestic animals in which the physiology of the digestive and reproductive systems is emphasized. 4 lectures and 1 lab. (5F or W) **Binns and Staff**

120. Animal Hygiene. The principles and practices necessary to maintain the health of livestock. The causes, descriptions, control, and prevention of the prevalent diseases are also studied. (4S) **Miner**

140. Veterinary Parasitology. External and internal parasites of domestic animals. A detailed study is made of life cycle, identification, methods of control, and treatment of infested animals for each individual parasite. (5F) **Staff**

170. Poultry Hygiene. The principles and practices necessary to maintain poultry health. The causes, description, control, and prevention of the common diseases affecting poultry in this region. Taught alternate years. Not offered in 1951. (3S) **Miner**

200. Special Problems. Open to students who are majoring in some related field and who wish to study some particular phase of a disease in animals. Any quarter. Time and credit arranged. **Staff**

210. Research. Outlining and conducting research on animal diseases. Any quarter. Time and credit arranged. **Staff**

PRE-VETERINARY TRAINING

Students desiring to work toward a degree in Veterinary Medicine (D.V.M.) must have at least two years of pre-veterinary training at some authorized college or university. Because of the large number of students in the United States desiring to study veterinary medicine, most students find it necessary to obtain a bachelor of science degree before they are accepted by a veterinary school. This is highly recommended because it gives the student a well-rounded background before starting the technical course. Students majoring in bacteriology, zoology, animal husbandry, dairy husbandry, poultry husbandry, or chemistry

will complete the requirements for entrance into a veterinary school, except in some cases where additional chemistry, physics, and mathematics may be required. This school does not give a degree in veterinary medicine. Enrollment in veterinary schools is limited, and students from the state in which the school is located are given preference; therefore, students from this school must be well qualified to be accepted. A suggested three year pre-veterinary course has been drawn up. Any student wishing to take the prescribed pre-veterinary course and who fulfills the college requirements with a minimum of 141 credits, can, after one year at an accredited veterinary school, obtain a bachelor of science degree from this institution.

Suggested Pre-Veterinary Courses

Course	Credit
Zoology 3, 4, 118	15
Chemistry 3, 4, 5, or 10, 11, 15	15
Organic Chemistry 121, 122, or 125, 126	10
Physics 20, 21, 22 or 6, 7	15 or 10
Mathematics 34, 35, and 44 or 46	13 or 11
Botany 24	5
Animal Husbandry 1, 10, 150, 151	15
Poultry 1, 2, or 101, 102	4
Dairy 1 or 109, or 110	3
English 10, 110	9
Agronomy 131, 132	6

It is recommended that the electives be taken in the Language and Arts, and Social Science groups as indicated in the catalog, pages 47 and 48.

Zoology

Zoology, Entomology, Physiology, and Nursing

Administered jointly by the School of Agriculture
and the School of Arts and Sciences

D. M. Hammond, G. F. Knowlton, Clyde Biddulph, Eldon J. Gardner, Professors; J. Sedley Stanford, G. H. Kelker, William F. Sigler, Associate Professors; Merrill Gunnell, Thomas L. Bahler, Assistant Professors; Gene H. Linford, Instructor; Howard E. Dorst, F. V. Lieberman, G. E. Bohart, H. F. Thornley, George H. Kaloustian, Walter E. Peay, S. J. Snow, William P. Nye, Collaborators in Research, U.S.D.A.

C. J. Sorenson, Professor Emeritus.

In addition to course work the Department of Zoology, Entomology and Physiology offers excellent opportunities for research and graduate study in various phases of agricultural entomology, taxonomy and morphology of insects, genetics and parasitology. Frequently, further training and experience in these fields may be obtained by participation in the work of research projects of the Agricultural Experiment Station.

Requirements for a Major in Agricultural Entomology:

Zoology 3 Invertebrate Zoology	109 Advanced Economic
4 Vertebrate Zoology	Entomology
106 Zoological Literature	115 Medical and Veterinary
112 Principles of Genetics	Entomology
116 Parasitology	120 Insect Pollination in Relation
Entomology 13 General Entomology	to Agriculture
101 Insect Morphology	125, 126 Seminar
102, 103 Systematic Entomology	156 Chemistry of Insecticides
	and Fungicides

See Zoology under School of Arts and Sciences, for course descriptions.

SCHOOL OF ARTS AND SCIENCES

CARLTON CULMSEE, Dean

General Information	102
Bacteriology and Public Health	104
Botany and Plant Pathology	104
Chemistry	106
English and Journalism	110-114
Geology and Geography	115
History	117
Landscape Architecture and Planning	118
Department of Mathematics	118
Military Science and Tactics	120
Modern Languages and Latin	122
Physics	124
Speech and Drama	127
Zoology, Entomology, and Physiology	131
Nursing	136

General Information

IN ADDITION to training students to carry on their work in the technical divisions of the Institution, the School of Arts and Sciences offers opportunity to all the students of the College to lay the foundation for a liberal education. The need to understand our own culture as well as the cultures of other nations has never in history been so urgent as now. Such understanding is the surest path to permanent peace in the postwar world. Many of the courses in Arts and Sciences qualify the student directly to play his part as an informed citizen in attempts to realize that great hope. The curricula of Arts and Sciences also enable properly qualified students to major in its departments and thus begin preparation for a career.

The School of Arts and Sciences includes the departments of Bacteriology and Public Health, Botany and Plant Pathology, Chemistry, English and Journalism, Geology, History, Landscape Architecture and Planning, Mathematics, Military Science and Tactics, Modern Languages and Latin, Physics, Speech, Zoology, Entomology, Physiology, and Nursing.

SUGGESTED COURSES FOR FILING GROUP REQUIREMENTS

The need of a general education which includes the elements necessary to an understanding of the universe and man's place in it is widely recognized. Below is an attempt to help students satisfy group requirements in such a way that they will not neglect certain subjects regarded as essential in a basic education. Majors in Arts and Sciences departments are urged to fill their groups from the following courses:

1. Biological Science:

Botany 1 or Zoology 1 (Principles of Biology).....	5 credits
Bacteriology 1 and 2 or Physiology 4.....	5 credits

2. Exact Science (at least 10 credits):

Physical Science 31 and 32 (in Chemistry, Geology, Mathematics, or Physics)	
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3. Language and Arts (at least 10 credits):

English—Any Lower Division Literature course	
Language—Any beginning course in French, German, Portuguese, Spanish, or Latin	
Speech—Any Lower Division course.	

4. Social Science:

History 4 (World Civilizations)	5 credits
Pol. Sci. 1 (Government and the Individual)	5 credits
or	
Pol. Sci. 10 (American National Government).....	5 credits

In addition it is urged that students add to their liberal education by electing courses in Art or Landscape Architecture and Planning, Music, Economics, Psychology, and Sociology.

PRE-MEDICAL TRAINING

The School of Arts and Sciences offers the necessary courses to provide a pre-medical training which will satisfy the entrance requirements of Medical Schools of the United States and Canada.

SUGGESTED PRE-MEDICAL SCHEDULE

Freshman Year
(Lower Division)

	F	W	S
Zoology 3, 4	5	5	—
Chem. 3, 4, 5	5	5	5
Math. 34, 35, 44	3	5	3
English 40 or 52	—	—	5
Military Science	1	1	1
Electives	3	1	3
Total	17	17	17

Sophomore Year
(Lower Division)

	F	W	S
German, French or Latin	5	5	5
English 10	—	5	—
Physics 20, 21, 22	5	5	5
Chem. 15 or 115	—	—	5
Electives	5	2	2
Total	15	17	17

Junior Year
(Upper Division)

	F	W	S
Chem. 121, 122 or 125, 126	5	5	—
Zoology 118, 119	—	5	5
English 110	—	—	4
Electives	12	7	8
Total	17	17	17

Recommended electives are Scientific Vocabulary (Engl. 5), Psychology, Heredity, College Grammar or Technical Writing, History, Political Science, Sociology and Economics.

Pre-medical students interested in graduation from this College before attending medical school may major in Chemistry, Physics, Zoology, or other related fields. For the pre-medical major in Zoology, see introduction to Department of Zoology, Entomology and Physiology.

Students interested in a pre-osteopathic program should consult the pre-medical adviser.

PRE-MEDICAL TRAINING

Students planning to go into the profession of Dentistry may take the necessary courses in the School of Arts and Sciences to satisfy the requirements for admission to any of the Schools of Dentistry in the United States.

SUGGESTED PRE-DENTAL SCHEDULE

Freshman Year
(Lower Division)

	F	W	S
Chemistry 3, 4, 5	5	5	5
Zoology 3, 4	5	5	—
Mathematics 34, 35*, 44*	3	5	—
English 40 or 52	—	—	5
Military Science 1, 2, 3 or P. E.	1	1	1
Electives (optional)	3	1	3
Total	17	17	17

Sophomore Year
(Lower Division)

	F	W	S
Chemistry 121, 122 or 125, 126	5	5	—
Physics 20*, 21*, 22*	5	5	—
Zoology 118	—	5	—
English 10, 110	5	—	4
Military Science 4, 5, 6, or P. E.	1	1	1
Electives (optional)	1	1	17
Total.....	17	17	17

*A number of the Schools of Dentistry require a minimum of only 9 or 10 credits of physics. Students planning to enter one of these schools may take Physics 6 and 7 instead of Physics 21, 22, and 23, and in this case, Mathematics 35 and 46 may be omitted.

Recommended electives are Psychology, History, Political Science, Sociology, Economics, and English.

Students planning to receive a B. S. degree on a combined curriculum (three years here and one year in a Medical or a Dental school) must fulfill the group and composition and military requirements of this College and must complete a minimum of 141 credits of pre-professional work.

B. S. DEGREE FOR NURSES

Through a joint program offered by Utah State Agricultural College and Logan L.D.S. Hospital, girls may earn both a Bachelor of Science degree and Registered Nurse credentials in four calendar years of study. Part of the time is spent at the College, part of it at the hospital in Logan, and part at Denver General Hospital. Persons interested in the program should address inquiries to the Division of Nursing at the College or to the Superintendent of Nursing Training, Logan L.D.S. Hospital, Logan. See Division of Nursing in Zoology, Entomology, Physiology, and Nursing Department, School of Arts and Sciences.

Bacteriology and Public Health

Administered jointly by the School of Agriculture
and the School of Arts and Sciences

J. E. Greaves, Professor Emeritus; **W. Whitney Smith** (Chairman), **W. B. Preston**, **Kenneth R. Stevens**, Professors; **John H. Carlquist**, Special Professor; **L. W. Jones**, Associate Professor; **Russell Fraser**, Special Instructor; **Ann Burns**, Instructor; **Keith M. Budge**, **Paul H. Krumpelman**, Temporary Instructors.

Bachelor of Science Degree

General Bacteriology majors should take: Bact. 70, 101, 102, 104-105 or 120, 110 or 170, 131 or 140, 160, 166 or 167, 180, 191, 192, 193; Chemistry 3, 4, 5, 117, 118, 121, 122, 191; Mathematics 35, 44; Physics 21, 22 (6 and 7 will be accepted in special cases); Public Health 50, Botany 24, 25; Zoology 3, 4; Library Science 106.

Clinical (Medical Laboratory) Technology Majors should take during their first, second and third years: Bact. 70, 101, 102, 131, 160, 162, 164, 166, 167; Chemistry 3, 4, 5, 12, 17, 18, 190, 192; Physiology 20, 21; Physics 6, 7; Public Health 50; Zoology 3, 4, 116, 117; and meet all college requirements, except total credits and upper division. A hospital internship for twelve months shall be completed during the fourth year which shall include instruction in Bact.

133, 134, 135, 136, 137, 138 and 139. Utah State Agricultural College has made provisions for the instruction of laboratory technicians in this internship in the W. H. Groves L. D. S. Hospital in Salt Lake City. During this fourth year, students will register for three quarters. When this program is satisfactorily completed, students are eligible for the Bachelor of Science Degree in Medical Technology. The student may then also apply for certification by the Registry of Medical Technologists after completion of a qualifying examination given by the American Society of Clinical Pathologists. (Consult W. Whitney Smith for further details).

Health Education Majors should take: Bact. 1; Public Health 50, 141, 142, 144, 155, 156; Physical Education 55, 84, 106, 191; Psychology 33, 53, 105; Foods and Nutrition 5; Sociology 60, 70; Social Work 162; Zoology 1, 11; Speech 5, 67; Physical Science 31, 32 and additional courses to meet teaching certificate requirements.

Physical Education—Health Education composite majors should see H. B. Hunsaker.

Minors in Health Education should take: Public Health 50, 156; Nutrition 5; P.E. 84; Soc. Work 165; Public Health 141 or Psych. 145 or Soc. Work 162 or P.E. 55 or Soc. 60 or Soc. 160. (Physiol. 4 should be taken in Biological Sci. group.)

Public Health Majors should take: Public Health 50, 140, 141, 142, 143, 144, 155, 156; Bact. 1, 2, 131, 160, 162, 164, 166; Chemistry 10, 11, 12, 190; Physiology 20, 21; Physics 6, 7; Zoology 3, 4, 111, 116. Except for those who find employment as Sanitarians, a Bachelor's Degree should always be followed by Graduate work.

Master of Science Degree

Research and graduate courses are available in the various specialized fields, with strong support from related departments and agencies. Courses numbered 200 and above are designed for graduate students. Courses 102, 110, 120, 131, 144, 162, 164, 166, 167, 170 and 180 may be used for credit by graduate majors in Bacteriology. These courses and the following—104, 105, 140, 141, 142, 143, 156, 160 and 167—may be modified and used for credit by graduate students in related departments.

See Bacteriology and Public Health in the School of Agriculture for course listings and other degree offerings.

Botany and Plant Pathology

Administered jointly by the School of Agriculture and
the School of Arts and Sciences

B. L. Richards, F. B. Wann, Professors; W. S. Boyle, Associate Professor; George W. Cochran, Associate Research Professor; Arthur H. Holmgren, Assistant Professor and Curator of the Intermountain Herbarium; R. A. Bush, Instructor; Bassett Maguire, Curator New York Botanical Garden, Non-Resident Professor; Orson S. Cannon, Bryce N. Wadley and George Kaloostian, Collaborators, U.S. Dept. of Agriculture.

Bachelor of Science Degree in Botany

Course requirement for a major: 24, 25, 30, 116, 117, 120, 130, 150.

Course requirement for a teaching major: 24, 25, 30, 120, 130.

Recommended additional courses for specialized fields: Pathology 121, 131, 135, 151; Taxonomy, 104, 108, 112; Physiology, 121, 224, 228; Cytology, 118.

See pages 47 and 48 for courses that may satisfy group requirements.

Master of Science Degree in Botany

The Department of Botany offers opportunity for research and graduate study leading to a Master of Science Degree in the following specialized fields:

Pathology, Taxonomy, Physiology and Cytology. The research and graduate possibilities in these fields are greatly augmented through the cooperation of the United States Department of Agriculture and the Intermountain Herbarium.

The following courses of the 100 series may be used for graduate credit by students majoring in the Department of Botany: 104, 118, 121, 151.

The following courses may be modified and used for graduate credit for students in other departments: 104, 117, 118, 120, 121, 130, 131, 135, 150, 151.

See Botany and Plant Pathology in School of Agriculture for course listings.

Chemistry

Reuben L. Hill, Sherwin Maeser, Delbert Greenwood, Professors; Melvin C. Cannon, *Theodore M. Burton, Harris O. Van Orden, Associate Professors; *Aubrey W. Lawrence, Assistant Professor; Faye Y. Moser, Sigrid S. Kennington, Instructors.

The degree of Bachelor of Science in Chemistry is a professional degree and graduates must meet the minimum requirements of the American Chemical Society in addition to fulfilling the group requirements of the College as given on pages 47-48 of this catalog. To aid the student in registering, the following suggested schedule is given.

Suggested Schedule

Freshmen

- A. For students having completed $1\frac{1}{2}$ units of high school algebra and $\frac{1}{2}$ unit of geometry:

	F	W	S
Chem. 3, 4, 5	5	5	5
Math. 35, 46, 97	5	5	5
Group requirements in biological and/or social sciences	5	5	5
Physical Education or Military Science and Tactics....	1	1	1
	<hr/> 16	<hr/> 16	<hr/> 16

- B. For students who enter college with credit for only 1 unit of algebra and $\frac{1}{2}$ unit of geometry:

	F	W	S
Chem. 3, 4, 5	5	5	5
Math. 34, 35, 46	5	5	5
Group requirements in biological and/or social sciences	5	5	—
Eng. 10 or 11 (special petition must be made to take this course in freshman year)	—	—	5
Physical Education or Military Science and Tactics....	1	1	1
	<hr/> 16	<hr/> 16	<hr/> 16

Sophomores

- A. For students with mathematics:

	F	W	S
Math. 98, 99	5	5	—
English 10 or 11	—	—	5
Physics 20, 21, 22	5	5	5
Chemistry 17, 18, 19	4	4	3
Lower Division requirements	3	3	4
Physical Education or Military Science and Tactics....	1	1	1
	<hr/> 18	<hr/> 18	<hr/> 18

*On leave.

NOTE: Five credits lower division group requirements must be completed in junior year.

B. For students with incomplete mathematics:

Math. 97, 98, 99	5	5	5
Physics 20, 21, 22	5	5	5
Chemistry 17, 18, 19	4	4	3
Lower division group requirements	3	3	3
Physical Education or Military Science and Tactics.....	1	1	1
	<hr/> 18	<hr/> 18	<hr/> 17

Juniors

	F	W	S
Chemistry 121, 122, 123	5	5	5
German	7	7	2
Electives in geology, biology, social science, English lit.	5	5	10
	<hr/> 17	<hr/> 17	<hr/> 17

Seniors

	F	W	S
Chemistry 104, 105, 106	3	3	3
Chemistry 109, 110, 111	1	1	1
Chemistry 135	3	—	—
Chemistry 160	1	1	1
Chemistry 191	—	—	5
English 111	—	4	—
Physics 120, 121, 130	3	3	3
Electives (must include at least 3 credits adv. chem.) ...	6	4	5
	<hr/> 17	<hr/> 16	<hr/> 18

Master of Science Degree in Chemistry

The Chemistry Department offers the Master of Science degree with research in any one of the following fields: Analytical, Biological, Inorganic, Organic, and Physical. In addition to the graduate courses (in the 200 series) courses 116, 135, 155, 191 may be used towards the Master's Degree in Chemistry. Any course in the 100 or 200 series may be counted towards the Master's Degree by other departments if the committee chairman approves.

Before admission to candidacy for the Degree all graduate students will be required to pass the National Cooperative Test Examinations of the American Council of Education for undergraduate training in General Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Chemistry and Physical Chemistry.

1. Introductory Chemistry. Designed to give a broad view of the cultural aspects of chemistry. This is a terminal survey course and cannot be used as a prerequisite for advanced courses in chemistry. (5F) **Moser**

2. A laboratory course for nurses to accompany Chemistry 1. (2F) **Moser**

3, 4, 5. Chemical Principles and Qualitative Analysis. An introduction to chemical theory and the principles of chemistry including introductory qualitative analysis in the spring quarter. Prerequisites: high school chemistry or physics, algebra and geometry. This course is designed for science majors, pre-medical and pre-dental students and home economics majors in foods and nutrition. Three lectures, two labs. (5F. 5W. 5S) **Maeser**

10, 11, 12. General Chemistry. An introduction to the fundamental principles of inorganic and organic chemistry. A one-year terminal course open to any matriculated student. Students with a grade of B or better may enter Chemistry 5 in the spring quarter. (5F. 5W. 5S) **Staff**

Chemistry 15 or 115. The basic theory and laboratory practice of quantitative analysis for premedical and pre-dental majors. Prerequisite: Chem. 5 (5S) **Cannon**

17, 18 or 117, 118. Quantitative Analysis. Theory and practice of gravimetric and volumetric analysis. A terminal course for majors in agriculture and home economics. Prerequisite: Chem. 5. (4F. 4W) **Cannon**

19 or 119. Quantitative Analysis. A continuation of Chemistry 18. Required of chemistry majors. (3S) **Cannon**

31, 32. Physical Science. Principles essential to understanding of physical universe. Elements of astronomy, chemistry, geology, mathematics and physics integrated for use in interpreting human experience. (5W, 5S)

104, 105, 106. Physical Chemistry. Including atomic, kinetic, and electron theories, gaseous liquid and solid state; solutions and thermodynamics. Prerequisites: Physics 20, 21, 22; Chem. 5; Math. 98. (3F. 3W. 3S) **Maeser**

107, 108. Dairy Chemistry. The chemistry of milk and milk products including tests for adulterants, preservatives, and routine quantitative methods of analysis of dairy products. Prerequisites: Chem. 12 or 122. (4F. 4W) **Hill**

109, 110, 111. Physical Chemistry Laboratory. To accompany Chemistry 104, 105 and 106. (1F. 1W. 1S) **Staff**

116. Inorganic Preparations. A laboratory course in practical laboratory methods of synthetic inorganic chemistry. Prerequisites: Chem. 5 and 103. Any quarter. Time and credit arranged. **Maeser**

121, 122. Organic Chemistry. An introductory course in the fundamentals of the chemistry of the carbon compounds. Prerequisites: Chem. 5 or a grade B or better in Chem. 12. (5F. 5W) **Van Orden**

123. Organic Chemistry. A continuation of Chemistry 122 covering more advanced theories and reactions. Prerequisite: Chem. 122. (5S) **Van Orden**

124 or 224. Organic Preparations. An advanced laboratory course in the synthesis of more complex compounds. Prerequisite: Chem. 123. (3F) **Van Orden**

125, 126. Applied Organic Chemistry. Biological applications are emphasized. Designed especially for students in Agriculture, Home Economics, and Nutrition. Chem. majors should register in Organic Chem. 121 and 122. Prerequisite: Chem. 5 or 11. (5F. 5W) **Hill**

132 or 232. Colloidal Chemistry. Chemistry of colloids and their relationship to the vital processes in plant and animal life. Prerequisite: Chem. 122. A background in Physical Chem. is desirable. (3) Time arranged. **Staff**

133 or 233. Colloidal Chemistry. Laboratory. Accompanies Course 132. Time and credit arranged. **Staff**

134 or 234. Qualitative Organic Analysis. The classification, reactions and laboratory work involved in identification of unknown organic compounds. Prerequisites: Chem. 19 and 123. (3S) **Van Orden**

135. Chemical Literature. The types of information available in technical publications; exercises in finding, assembling and using such information. (3F) (This course should precede or accompany English 111.) **Van Orden**

140 or 240. Physico-Chemical Methods. An advanced laboratory course. Any quarter. Time and credit arranged. **Maeser**

150 or 250. Advanced Inorganic Chemistry. Based on the periodic table and atomic structure. Designed for Chemistry seniors and graduates and others with similar training. (3W) **Maeser**

155. Glass Blowing. A laboratory course in the technique of manufacture and repair of laboratory glassware. For Chemistry majors. Others admitted only by special permission. Class limited to five students. (2W) **Staff**

156 or 256. Chemistry of Insecticides and Fungicides. Designed especially for advanced students in entomology, plant pathology, and agriculture; deals with the chemical composition, stability, toxicity, and effectiveness of commercial insecticides and fungicides. Prerequisite: Chem. 12 or 122. (2W) **Hill**

160, 260. Seminar. (1F, W or S) Time arranged. **Staff**

170, 270. Chemical Microscopy. Lecture and laboratory practice in the use of the microscope and its accessories as applied to chemistry. Practice in the

examination and analysis of inorganic substances containing the more common elements, with special reference to rapid qualitative methods and analysis of minute amounts of material. Prerequisite: Physical Chem. or special permission. (2 or more; W) **Cannon**

171, 271. Quantitative Micro-Analysis. Laboratory practice and lecture in the use of the micro-chemical balance, microanalysis of carbon, hydrogen, halogens, sulphur, phosphorous, Kjeldahl and Dumas nitrogen, micro molecular weight determination. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (2 or more; S) **Cannon**

172, 272. Optical Methods of Chemical Analysis. Lecture and laboratory problems in spectroscopy, spectrophotometry, colorimetry, refractometry and microscopy. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (3F) **Cannon**

173, 273. Electro-Chemical Methods of Analysis. Lecture and laboratory instruction in Potentiometry, Polarography, Electro-analysis, and related methods as applied to Analytical Chemistry. Prerequisites: Quantitative Analysis and Physical Chem. or special permission. (3W) (Not given 1950-51) **Cannon**

174, 274. Advanced Quantitative Analysis. An advanced course illustrating the techniques and practices in the analysis of complex substances, such as rocks, minerals, gases, water supplies, etc. Prerequisite: Chemistry 19 or 119. Spring. Time and credit to be arranged. **Cannon**

90 or 190. Elementary Biochemistry. The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins, and hormones and their transformations in plants and animals. Prerequisites: Chem. 12 or equivalent. For students not majoring in Chemistry. (5F) **Greenwood**

189 or 289. Animal Metabolism. Feeding experiments involving the development of amino acid, vitamin, mineral, and other nutritional deficiencies in animals. Chemical and biological tests made on rations, animal tissues, blood, urine, and other secretions and excretions when indicated. Time and credit arranged.

191 or 291. Biochemistry. The chemistry of proteins, carbohydrates, fats, minerals, enzymes, vitamins and hormones and their transformations in plants and animals. Prerequisite: Chem. 122 or equivalent. For students majoring in Chem. and others with adequate background in Chemistry. (5S) **Greenwood**

192 or 292. Biochemistry. Problems in metabolism—micro-methods of blood and urine analysis with their applications to metabolism and to the diagnosis and treatment of disease. Prerequisite: Chem. 190 or 191 or equivalent. (3F) **Greenwood**

193 or 293. Biochemistry. Preparations of enzymes or amino acids as arranged. Prerequisite: Chem. 109 or 191. Time and credit arranged. Any quarter. **Greenwood**

194 or 294. Biochemistry. Microbiological and colorimetric methods for determination of vitamins and amino acid in plant and animal tissues. Prerequisites: Chem. 190 or 191 and Bact. 70 or 71. (3W) **Greenwood**

195 or 295. Advanced Biochemistry. Carbohydrates, proteins, fats and minerals and their metabolism in plants and animals. Prerequisite: 190 or 191. (2F) **Greenwood**

196 or 296. Advanced Biochemistry. Enzymes and their role in plants and animals. Prerequisite: Chem. 190 or 191. (2W) **Greenwood**

197 or 297. Advanced Biochemistry. Vitamins and hormones and their function in plants and animals. Prerequisite: Chem. 190 or 191. (2S) **Greenwood**

198 or 298. Research. Senior or graduate students majoring in chemistry may elect research in any branch of the subject. Any quarter. Time and credit arranged. **Staff**

225, 226, 227. Advanced Organic Chemistry. Lecture course for graduate students. Outstanding seniors may register by special permission. Course includes modern theories and special topics in organic chemistry. Prerequisites: Chem. 123, 106. (2F, 2W, 2S) **Van Orden**

English

Wallace J. Vickers, Chairman; King Hendricks, Carlton Culmsee, Professors; Ira N. Hayward, Hubert W. Smith, Wendell M. Keck, Moyle Q. Rice, Associate Professors; Alice Senob, Stanley P. Andersen,* Maxwell D. Edwards, Assistant Professors; Pearl S. Budge,* Willard Heed, Veneta Nielsen, Dan H. Ludlow, Instructors.

English Major Requirements

Students who intend to major in English must complete English 1, 10, 53, 60, and 61 before beginning work on the required upper-division courses. It is highly desirable to complete History 34 and at least one year of a foreign language during the freshman and sophomore years.

English 105, 110, 118, or Journalism 112, 162, 163, 196, two period courses (161, 175, 180, 190, 191), one additional literature course numbered above 120, and at least 19 credits of a foreign language are required of majors in English. English 123, The Teaching of English is recommended for English majors and teaching majors in English. Students must maintain a "B" grade average in their major subjects. Teaching majors in English meet the same requirements except foreign language.

Students whose major interests are divided between English and Speech may take a composite English-Speech major. Such a major relieves the student of all requirements for a minor. English-Speech majors should take English 1, 53, 118, 163, 180, 190, 191; Journalism 12 (three credits) and 112; Speech 150 (6 credits); 10 credits of Interpretation, including 124; and 10 credits of Public Speaking, including either 25 or 109; 10 credits of Speech corrective work; and Speech 123.

A. Drill in Essentials of English. To assist students with English deficiencies. Students whose standings in the Freshman Placement Examination show the need of such assistance are assigned to one of the sections as a prerequisite for English 10 and English 17. (3F, W or S) Daily. **Staff**

B. English for Foreign Students. To assist foreign students in gaining a sufficient command of the language to read textbooks with comprehension and to participate effectively in classroom activities. It is required of all foreign students failing to make required scores on English proficiency examinations administered at time of entrance into the College. Other foreign students may take the course as an elective. Daily. (3F or S) **Smith**

C. English for Foreign Students. A continuation of English B; required of students who have completed English B, and who in the judgment of the instructor require further special training in the language. Other foreign students may take the course as an elective. Daily. (3W) **Smith**

1. College Grammar. (5F or W) **Vickers**

2. Mechanics of Writing. A drill course in the fundamentals of sentence structure, word usage, punctuation, and spelling, with emphasis on correct diction and grammar as aids to precision in writing. (3F, W or S) **Staff**

5. Scientific Vocabulary. A study of word formation and derivation as a means of understanding scientific terms and of acquiring a vocabulary. (3 F, W or S) **Keck**

10. Sophomore Composition. Required of all students not offering its equivalent. May not be taken in the freshman year. Emphasizes correctness and effectiveness in sentence, paragraph and theme; gives practice in organization and outlining of material, and in expository writings; demands clear, forceful expression, and requires a full third of a student's time. (5F, W or S) **Staff**

11. Sophomore Composition. Should be taken in place of English 10 by sophomore whose record in the placement test indicates special aptitude in composition. Open only to students whose placement cards are marked "Eligible for English 11." (5F, W or S) **Edwards**

*On leave.

17, 18, 19. Freshman English. For Forestry, Engineering and Technology students only. Drill in fundamentals of sentence and paragraph structure. Exercises in grammar, vocabulary, and spelling. Composition, with stress on intelligent thinking and clear expression. Practice in writing letters and reports. (3F, 3W, 3S) **Staff**

20. Readings in Prose. Fiction, essay, biography. (5W or S) **Senob**

21. Readings in Poetry. To develop appreciation for poetry. Verse forms, the various types of poems, and the idea underlying lasting poetry are considered. (5F, W or S) **V. Nielsen**

24. Children's Literature. Prose and poetry of childhood and adolescence. Helpful to teachers and parents. (4F, W or S) **A. Smith, Carter**

25. Early Nineteenth Century Novel. Reading and analysis of the best works of major English, American, and Continental novelists. (3F) **Edwards**

26. Late Nineteenth Century Novel. Reading and analysis of works of novelists of Victorian England and their contemporaries in America and on the Continent.

27. Contemporary Novels. Reading and interpretation of the best twentieth century novels. (3F, W or S) **Rice and Smith**

28. Contemporary American Poetry. The principal American poets since 1900. The purpose is to help students enjoy and understand poetry as a living art. (3F) **Hayward, V. Nielsen**

29. Contemporary British Poetry. (3S) **Hayward V. Nielsen**

31. Floating Poetry. The poetry that has lived in the oral tradition since medieval times. The course is divided into four parts: the narrative ballad, the non-narrative poem, Negro poetry (including slave songs and spirituals), and children's poetry. (3) **Hendricks**

33. Contemporary Short Story. The technique of the short story. English, American, and European stories are analyzed. Encouragement is given to those who wish to write. (3W) **Rice**

34. Nineteenth Century Short Story. (3W) **Rice**

37. The Essay. Writers of the present—American and English. (3S) **Rice**

40. World Literature. A survey course including a study of epic and romance, tragedy, comedy, satire, etc., as these forms have appeared in Greek, Roman, Hebrew, Italian, French, German, English and American literature. (5F, W or S) **V. Nielsen**

43. Scandinavian Literature (In Translation). Selected readings from recent and traditional writers: short stories, novels, poetry. (3S) **M. L. Nielsen**

45. Readings in Philosophical Literature. Selected readings in the great philosophers from Plato to the present. (5W) **Hayward**

46. The Bible as English Literature. Provides an opportunity for first hand acquaintance with the great book of books. (5S) **Vickers**

47. Readings in Greek Literature. Provides an opportunity to become acquainted with Greek epics and dramas. (5F) **Vickers**

51. Early American Literature. Our National Literature from Colonial times to Herman Melville. (3W) **Hayward**

52. Later American Literature. American Literature from Walt Whitman to the present. (3S) **Hayward**

53. American Literature. Survey of American literature from the beginnings to the present, with emphasis on work expressing the democratic spirit or in other ways portraying ideas characteristic of American culture. Open to English majors or minors and to others by permission of the instructor. (5F) **Hayward**

57. Whitman and Sandburg. A study of the attempts of two poet-philosophers to catch the American spirit—one writing with the surge of the frontier, the other writing in its wake. (3) **Andersen**

60. English Literature. A survey of the principal masterpieces of English literature. (5W) **Edwards**

63. Shakespeare. Offers the opportunity to gain a general knowledge of Shakespeare by reading a liberal number of his plays and participating in class discussions upon them. (3W) **Vickers**

83. **Wordsworth.** (3) Senob
85. **Shelley.** His relation to the Romantic movement. (2) Rice
88. **Browning.** Chiefly a study of his monologues and selected dramas. (2S) Andersen
105. **History of the English Language.** The evolution of the English language from Anglo-Saxon times to present. (3F) Hendricks
110. **Advanced Composition.** For students who have taken English 10 or 11; may be taken in place of English 19 by students who have credit in English 17 and English 18 and who have transferred from Forestry or Engineering; may be taken by transfer students who have six credits in Composition. Emphasizes vocabulary, selection and clear organization of material. (4F, W or S) Staff
111. **Technical Writing.** Emphasis upon bibliography, research methods, and final form of the technical report. (4F, W or S) Keck, Edwards, Senob
112. **Junior English.** An advanced course more general in nature than English 111. Designed for students in Forestry or Engineering who do not anticipate doing research writing. Not open to students who have taken 111. (4F, W or S) Keck, Heed
- 117 a. b. **Writer's Workshop.** For students who desire special assistance in imaginative writing. Admission is granted to all who show a particular talent in writing. Prospective students are required to consult the instructor before registering. (2F, 2W) Culmsee
118. **Poetry Workshop.** Direction and criticism for students who wish to write poetry. (2S) V. Nielsen
119. **Creative Writing.** Short stories, essays, poetry. Considerable freedom of choice as to type. To register, consult instructor. (3F) Rice
123. (Education 123.) **The Teaching of English.** A practical course for those who are either teaching or planning to teach English in public schools. The purpose is to study both materials and methods in the three fundamental areas of English instruction: grammar, composition, and literature. Satisfies part of education requirement for teachers' certificate. (4F) Hayward
134. **Literary Criticism.** Masterpieces of criticism from Plato and Aristotle to Croce studied to develop an awareness of critical standards throughout the ages. (4S) Senob
135. **Modern Literary Criticism.** Critical essays since Croce, with particular attention to T. S. Eliot and the modern American School. (4) Culmsee
150. **American Poetry.** Development of American poetry as shown through writings of major poets from Philip Freneau to the present. (3W) Hayward
151. **American Biography and Autobiography.** To introduce American biography and autobiography as an enjoyable and important form of literature and as a source of valuable sidelights on American thought and culture. (3S) Hayward
152. **American Fiction.** A brief consideration of the beginning of the American novel and short story, followed by detailed study of important nineteenth and early twentieth century fiction writers. (3F) Smith
153. **American Drama.** Historical treatment of American drama, with extensive reading of representative plays. (3S) Smith
154. **Poe.** The poetry, short stories and literary criticism of Edgar Allan Poe studied in relation to his social and literary theories. (3) Hayward
155. **Emerson.** Detailed analysis of his poetry and essays; consideration of his relationship to other major literary figures of the period. (2F) Smith
156. **Hawthorne.** The novels, short stories, and social criticism of Nathaniel Hawthorne as a reflection of the American cultural heritage. (2W) Hayward
157. **Melville.** A study of his fiction as a type of exotic romance, with some consideration of the large amount of critical writing done about him since 1920. (2) Smith
158. **Mark Twain.** Study of his works as a record of a distinctive American culture and as social criticism. (2) Smith

159. James. The novels and short stories of Henry James studied in the light of his literary and social philosophy, and as a reflection of American culture after the Civil War. (2) **Hayward**

143. Soviet Literature in Translation. Literature produced in Soviet Russia between 1918 and the present. Special emphasis on works of Gorki, A. Tolstoi, Ehrenburg and Sholokov. (5) **Hendricks**

161. Medieval Literature. English literature from Beowulf to the Renaissance, exclusive of Chaucer. Emphasis on the epic and metrical romance. Some continental literature included. Reading in translation. (5) **Vickers**

162. Chaucer. Relation of Chaucer to his time; his influence upon subsequent literature. Emphasis upon oral reading. (5W) **Hendricks**

163. Shakespeare. Six plays: Macbeth, Henry IV, King Lear, Hamlet, Othello, Twelfth Night; collateral readings. (5S) **Vickers**

164. Elizabethan Playwrights, Exclusive of Shakespeare. Plays selected from Marlowe, Dekker, Jonson, and others. (4F) **Senob**

167. Arthurian Legends. The legends and their relation to English Literature. (3) **Nielsen**

168. Modern Drama. Reading and interpretation of the best plays, Continental, English, and American, from Ibsen to the present. (5) **Smith**

170. Milton. Selected prose and poetry with emphasis on Paradise Lost. (5W) **Vickers**

175. Elizabethan and Stuart Literature. Poetry and prose works, exclusive of those of Shakespeare and Milton from 1568 to 1660. (5S) **Rice, Senob**

180. The Eighteenth Century. A comprehensive study of the literature from 1660 to 1798. (5F) **Keck**

181. Eighteenth Century Essays. The development of the essay from the "Tatler" until the emergence of the critical reviews of the late 18th century. (2W) **Keck**

185. Eighteenth Century Novels. The major works of Defoe, Richardson, Fielding, Smollett, Sterne, and Goldsmith. (3) **Keck**

186. Restoration Drama. Principal plays of the Restoration, 1660-1706. (2W) **Senob**

187. Eighteenth Century Drama. Plays and players from the Augustan period until the end of the century. (2) **Keck**

188. English Hymnology. Literature and musical backgrounds of the rise of the English hymn from the 16th century psalmists until the early 20th century. (3) **Keck**

189. Eighteenth Century Poetry. Poetry and critical theories of composition from the age of Pope until the Romantic period. (3) **Keck**

190. Romantic Period. A brief study of the precursors of romanticism; a study of the literature from 1798-1832, with emphasis on poetry. (5) **Smith**

191. The Victorian Period. A comprehensive review of the literary influences and personalities of the period with emphasis on the chief poets and prose masters of the age. (5W) **Smith**

192. Wordsworth. (2) **Senob**

193. Shelley. (2) **Rice**

194. Browning. (2) **Andersen**

195. Arnold. (2) **Senob**

199. Readings and Conference. Time and credit arranged. Any quarter. Limited to English majors. Instructor's approval required. **Staff**

200. Thesis. Time and credit arranged. **Staff**

203. Tragedy. A study of the theory and practice of tragedy from Aeschylus to the present. (5) **Vickers**

204. Comedy. A study of the theory of comedy and of the use of comedy in various literary forms. (5) **Vickers**

211. Bibliography and Research Methods. An intensive course in preparation of bibliography, use of source materials, and other problems of thesis writing. Open to graduate students only. (2F, W or S) **Keck, Hendricks**

247. Seminar in Comparative Literature of the 18th Century. Research studies will be conducted in the inter-relations of English and continental literature between the years 1700 and 1832. Time and arranged. (4S) **Hendricks**

252. The New England Circle. The principal New England writers from Bryant to Henry Adams. (5) **Hayward**

261. Readings in Middle English. Middle English Metrical Romances. (4S) **Hendricks**

280. Seminar. An intensive study of special problems in 18th century literature. (4S) **Keck**

290. Seminar. Nineteenth Century Literature. An intensive study of special problems and selected writers of the period. (4) **Smith**

JOURNALISM

Major students in Journalism should complete Journ. 12, 13, 14, 16, 64 or 156, 81, 112, 125, 114, 115, 125; Engl. 1, 5, 10, 52 or 53, 110, 117 or 118 or 119.

They are urged to complete as many of the following as possible: Engl. 40 46, 60, 61, 63, 105, 134. It is recommended that a minor be selected from the following: Accounting, Art, Business Administration, Economics, History, Modern Languages, Political Science, Psychology, Sociology, Speech.

Students may major in Photographic Journalism, for which the following courses are required: Journ. 12, 13, 14, 112, 115 and one of these: 120, 131, 156. In addition the students must study all courses required by the Photography Department for this major.

4. Exploring Journalism. Discussions of opportunities in journalistic vocations and qualifications for success in these fields. Practice in various types of writing to enable students to estimate aptitudes and interests. (2F) **Culmsee**

12. Reporting. Lectures, practice, and group discussion on work of reporter and correspondent. Students are required to cover assignments for college, local, and state newspapers. (3F) **Nelson**

13. Reporting. A continuation of 12 with emphasis on newspaper style, ethics, social responsibilities, and problems of reporting. Practical experience writing for newspapers. Prerequisite: 12. (3W) **Nelson**

14. Reporting. A continuation of 13. Prerequisites: 12 and 13. (3S) **Nelson**

16. Copyreading. Primarily a laboratory course in handling of newspaper copy, headline, page layouts. Prerequisites: Journalism 12, 13. (3S) **Andersen**

51. General Photography. (See Commercial Photography Department for description. (3F, W or S) **Allen**

64. Publicity Methods. Media and methods used to inform the public and conduct public relations work as required by corporations, public institutions, service organizations, and governmental agencies. Prerequisites: 12, 13, 14 or permission of instructor. (3W)

81. Introduction to Radio. (See Speech Department for description.) (3F)

82. Radio Speech. (See Speech Department for description.) (3W) **B. Hansen**

83. Elements of Broadcasting. (See Speech Department for description.) (3S) **B. Hansen**

112. The Writing of Feature Articles. Lectures and practice in preparing feature articles for newspapers and magazines. Analysis of periodicals will be made to determine available markets and what editors will buy. (3W) **Culmsee**

114. Writing for Radio. Study and practice in writing information and interpretative continuity for radio programs. (3S)

115. Law of the Press. Law of libel, right of privacy, contempt of court, freedom of the press, copyright, and postal regulation. (2S)

116. History of Journalism. American newspaper men and their contributions to journalism; also modern newspaper trends. (5S) **Culmsee**

120. Agricultural Journalism. Problems of writing for, editing, and publishing weekly newspapers and magazines. Emphasis on writing farm and home news.

Intended to aid agricultural extension workers and others in preparing material for rural publications. (3S) **Culmsee**

124. Public Opinion and Propaganda. (See Political Science 124.) (3F)

125. Editorial Page. A study of editorials and other elements of the modern editorial page, and the writing of editorials. (3F)

131. Writing About Science. Techniques in the informal presentation of scientific information to ordinary people. For science majors who wish to write intelligibly about their fields as well as for journalism majors. Familiarity with basic scientific procedures and with some research problem is helpful. (3F) (Not given 1950-51)

151. Photographic Problems. (See Commercial Photography Department for description.) (3F, W or S) **Allen**

156. Principles of Advertising. (See Merchandising Department, School of Commerce, for description.) (5W)

182. Radio Newscasting and Writing. Offered in both Speech and Journalism Departments. Study and application of principles of editing, organizing, writing and presenting news by radio. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. (5S) **B. Hansen**

183. Radio Programming for the Rural Audience. (See Speech Department for description.) (3W) **B. Hansen**

185, 186, 187. Special Problems in Journalism. (1-2F, 1-2W, 1-2S)

Geology and Geography

J. Stewart Williams, W. Elmo Coffman, Professors;
Clyde Hardy, Assistant Professor.

Geology Club: The Geology Club, an organization of geology students under the supervision of the Geology Department meets in the lecture room of the Department at 8:00 p.m. on the second Thursday of each month. The programs consist of talks by guests, faculty members, and students. All interested persons are invited to attend. Regular attendance is required of all geology majors.

Major in Geology: The following courses, or their equivalents, outside the Department of Geology, are required of Geology majors: Chem. 3, 4, and 5; C. E. 63, 82, 84, and 85; English 110 and 111; Physics 20, 21, and 22; Math. 35, 46, 97, 98, and 99. The following courses in the department are required of majors: 2, 3, and 5; 101, 102, 104, 106, 108, 110, 112 or 113, 114, 115, and 120.

Field Trips: Since field work is a very essential part of the study of Geology, majors should be prepared to devote most of the Saturdays during the Fall and Spring quarters to this work. Two longer field trips, each of several days' duration, are taken each year, one in the Fall quarter and one in the Spring quarter. Majors should plan to take as many of these trips as possible, and attendance on the majority of the trips is required for a major.

Master of Science Degree in Geology

The Geology Department offers work toward the Master of Science degree in the fields of invertebrate paleontology, stratigraphy, areal geology and ground water geology. The following courses in the 100 series may be used for graduate credit by students majoring in the department of Geology: 102, 103, 107, 112, 113, 116, 117.

Any or all courses in the 100 series may be used for graduate credit by students in other departments.

2. Historical Geology. A continuation of Geology 3 covering historical geology. Prerequisite: Geo. 3. (5W) **Staff**

3. Physical Geology. For forestry, engineering, and soils students and others who desire a substantial introduction to physical geology. A five dollar deposit is required for loss and breakage of equipment. A one-day field trip required. (5F or S) **Staff**

5. Minerals, Rocks, and Fossils. A further study of common minerals, rocks and fossils, in continuation of courses 2 and 3. (3S)

31, 32. Physical Science. Principles essential to understanding of physical universe. Elements of basic physical sciences integrated for use in interpreting human experience. (5W, 5S) **Staff**

41. Introduction to Geography. Elements of the natural environment, their characteristics, distribution, and relation to human activities. (5F, W or S) **Coffman**

42. Economic Geography. The geography of the world's commodities and their regional aspects; economic activities of the principal political divisions of the world in the light of their geographic environment. (5W) **Coffman**

43. Human or Cultural Geography. The influence of geographic factors in the economic, social, and political development of peoples and states. (5S) **Coffman**

101. Mineralogy. Identification of the common minerals by means of physical and chemical tests. Elementary crystallography. Prerequisites: Geo. 3 and Chem. 3, 4, and 5 or equivalents. (5F)

102. Optical Mineralogy and Petrography. Optical properties of the common rock-forming minerals, and identification of these minerals in thin-sections and in refractive-index media with the petrographic microscope. Introduction to the classification of rocks, and correlation with the field classification. Prerequisites: Geo. 101 and Physics 22. (5W)

103. Engineering Geology. The application of geology to engineering problems. For seniors in Engineering. (3S) **Williams**

104. Regional Physiography of the United States. The physiographic provinces of the United States, and their influence on exploration, settlement and industrial development. Prerequisite: Geo. 3 or 4 or equivalent. (2F) **Coffman**

106. Invertebrate Paleontology. Introduction to the study of fossils. A living example of each of the groups of animals with important fossil representatives is used as an introduction to the fossil forms of that group. Methods of preparation and study are developed from work upon material collected by the student himself. Prerequisite: Geo. 2 and Zool. 3. (5W) **Williams**

108. Stratigraphy. Introduction to the processes by which the sedimentary rocks have been formed, and to their original structures, followed by a study of the stratigraphic systems and their identification by guide fossils. Field trips required. Prerequisite: Geo. 3 and Geo. 106. (5S) **Williams**

110. Structural Geology. Types and origin of rock structures, and their role in the formation of mineral veins, petroleum and natural gas fields, and the general architecture of the Earth. Prerequisite: Geo. 3 or equivalent. (5W) **Staff**

112. Economic Geology Nonmetals. Geologic occurrence and distribution of petroleum, natural gas, coal, building materials, and other non-metallic resources. Prerequisite: Geo. 101 and 110. (5W) **Staff**

113. Economic Geology Metals. Geologic occurrence and distribution of metalliferous deposits of the world. Prerequisite: Geo. 101 and 110. (5F)

114. Field Methods. Field practice in measurement of attitude and thickness of formations, field use of topographic maps, and note taking. Mapping by pacing and compass, and plane table. Prerequisites: Geo. 3, C. E. 81 and 82. (5S) **Williams**

115. Advanced Physical Geology. Phases of geology of particular interest to student of conservation in the Western States. Processes of erosion, action and development of streams, land forms, subsurface water, etc. Prerequisites: Geo. 3 and College Mathematics, Chemistry and Physics. (5F) **Williams**

16 or 116. Special Problems. Direction in the study of special problems in which a student has become interested, and upon which he desires to make written reports. From one to six credits, not to exceed two in any quarter. Time arranged. **Staff**

117. Ground Water Geology. Geologic conditions that control the occurrence and purity of ground water, with special reference to western United States. Prerequisite: Geo. 3 or equivalent. (2S)

120 or 220. Thesis. Upper division or graduate thesis. A thesis on some field problem is required of majors and five credits are given for its completion. Registration for undergraduate thesis is limited to Fall or Spring quarter. It must be for five credits and thesis must be completed in one quarter.

Registration for the graduate thesis may be for one, two or three quarters and nine to fifteen credits are given for its completion. Williams

145. Climatology. Elements of climate and their distribution. Controls of climate. Types of climate and their distribution with particular reference to natural vegetation and major soil groups. Prerequisite: Geo. 40 or equivalent. (3F) Coffman

146. Conservation of Natural Resources. Importance of natural resources and need for their conservation. Land as a natural resource and economic factor. Location as a factor in land utilization and value. Prerequisite: Geo. 41 or equivalent. (3W) Coffman

147. Cartography and Map Interpretation. Interpretation and appreciation of maps. A consideration of scales, symbols, and common map projections. Representation of geographic data by use of dots, isopleths, cartograms, and other graphic devices. A survey of various maps published. Prerequisite: Geo. 3 or 40. (3S) Coffman

230. Graduate Seminar. Time arranged. (2-5 F, W or S) Williams

History

Joel E. Ricks, John Duncan Brite, Professors; S. George Ellsworth,
Assistant Professor.

Students majoring in History should complete the following classes: History 1, 2, 13, 14, and 30 additional credits of upper division History selected in conference with the head of the department for registration.

History majors intending to pursue graduate work should complete two years of French or German.

1. Early European History. A survey of the medieval and early modern European periods from the fall of the Roman Empire through the period of the Renaissance, the Reformation and the religious wars. (5W) Brite

2. Modern European History. A survey of the early and recent periods of modern European history from the seventeenth century to the Second World War. (5S) Brite

4. World Civilization. Civilizations of the world from the Stone Ages to the Renaissance. (5F, W or S) Brite and Ellsworth

5. World Civilizations. Modern civilization from the Renaissance to the present. (5W) Ellsworth

8. Recent European History. From the Treaty of Versailles in 1919 to the present time, emphasizing the problems following the last war and the underlying causes of World War II. (3F, W or S) Ellsworth

13. Early United States History. Includes the colonization of the Atlantic seaboard, the Westward Movement, the Revolution, the Constitution, the beginnings of American government, the rise of American democracy, social and economic movements, the rise of sections, expansion, nationalism and the Civil War. (5F) Ricks

14. Modern United States History. Includes reconstruction, industrialism, the last frontier, the agrarian revolts, imperialism, the eras of reform, American culture, the new democracy and the two World Wars. (5 F, W or S) Ricks

34. English History. A survey of English history from the earliest times to the present day. (5F) Brite

105. Greek History. Greek civilization to the Roman conquest, 146 B.C. Emphasizes political, social and intellectual developments and contributions. (5W) Ellsworth

106. Roman History. From the beginnings of the Roman Republic to the decline and fall of the Empire in the fifth century A. D. (3) Ellsworth

- 111. Medieval Economic and Social History.** Economic and social development of the Middle Ages from the thirteenth to the seventeenth century. (5W) Brite
- 124. European History.** The Renaissance, the Protestant Revolution and the Catholic Reformation from the thirteenth to the seventeenth century. (5F) Brite
- 125. Absolute Monarchies.** (1618-1789) European History from Thirty Years' War to French Revolution. (3S) Brite
- 126. European History.** The French Revolution and Napoleon, 1789-1815. (3W) Brite
- 132. United States History.** History of the American Frontier to the Far West. (3W) Ricks
- 135 or 235. United States History.** History of the Far West. Deals with the region from the Rockies to the Pacific Coast with special emphasis upon the Intermountain West. (5S) Ricks
- 144. United States History.** The Civil War and Reconstruction. (3F) Ricks
- 159. Recent United States History.** Domestic and foreign affairs of the United States in the twentieth century, emphasizing the development of modern America and her role in world affairs. (3S) Ellsworth
- 161. Hispanic-American History.** The colonial period, from the discovery of America to the beginning of the nineteenth century. (3W) Ellsworth
- 175. History of American Democratic Thought.** Traces American democratic thought from the Revolutionary War to the present. (3W) Ricks
- 229. Seminar.** Problems in the Industrial Revolution. (3S) Brite
- 273. Problems in American Constitutional History to 1787.** (3F) Ricks
- 274. Problems in American Constitutional History 1787 to 1877.** (3W) Ricks
- 275. Problems in American Constitutional History Since 1877.** (3S) Ricks
- 292. Historical Method and Bibliography.** (3F) Brite
- 293. American Historiography.** (3W) Brite

Landscape Architecture and Planning

Administered jointly by the School of Agriculture
and the School of Arts and Sciences

Laval S. Morris, Professor; Kenji Shiozawa, Assistant.

3. Elements of Landscape Architecture and Planning.
20. Drawing.
30. History and Literature of Landscape Architecture.
35. Theory of Design.
40, 41. Plant Materials.
60, 61, 62. Architectural Design.
130. Recreational Planning.
140, 141, 142. Design.
150, 151, 152. Planting Design.
160, 161, 162. Landscape Construction.
165. Construction Methods and Practice.
170. Civic Planning.
180, 181, 182. Advanced Planning and Design.
190. Special Problems.
195. Seminar.
210. Advanced Problems.

See Landscape Architecture in School of Agriculture for course descriptions.

Department of Mathematics

V. H. Tingey, Professor; Neville C. Hunsaker, Associate Professor; Mary Nelson, Joe Elich, Assistant Professors; Joseph K. Everton, Instructor.

Two types of majors are offered in the Mathematics Department. Students intending to do graduate work in mathematics take the regular major. Those intending to teach in high schools take the regular major or the teaching major.

Regular majors are required to take Mathematics 130, 131, 132 and fifteen additional credit hours of upper division mathematics. Regular majors must have a reading knowledge of either French or German. Physics 20, 21 and 22 and nine credit hours of upper division physics are required. Fifteen credit hours of chemistry are required.

Students expecting to teach mathematics in high school must meet the State requirements for certification in addition to meeting the requirements of a regular major in mathematics. French or German is not required for those expecting to teach.

All students majoring in mathematics must have had plane and solid geometry. **Plane geometry is a prerequisite for all college mathematics.**

B. Plane Geometry. (F or W)

33. Solid Geometry. (2 F or W) Prerequisite: two years' high school algebra or mathematics 34.

34. Introduction to College Algebra. Prerequisite: one year of high school algebra. Students who have had more than one year of high school algebra are not given college credit for mathematics 34. Daily. (3F, W or S)

35. College Algebra. Prerequisite: 34 (5F, W or S)

44. Plane Trigonometry. Prerequisite: 35 (3F, W or S)

46. Plane and Spherical Trigonometry. Prerequisite: 35 (5F, W or S)

50. Descriptive Astronomy. (3S)

97. Plane and Solid Analytical Geometry. Prerequisite: 35 and 44 or 46. (5F, W or S)

98. Differential Calculus. Prerequisite: 97 (5F, W or S)

99. Integral Calculus. Prerequisite: 98 (5F, W or S)

100. Calculus. Prerequisite: 99 (3W or S)

118. Modern Algebra. Prerequisite: 99 (3W)

119. Theory of Equations. Prerequisite: 99 (3W)

120. Modern Geometry. Prerequisite: 97 (3W)

121. Projective Geometry. Prerequisite: 99 (3S)

122. Ordinary Differential Equations. Prerequisite: 99 (3F or S)

123. Number Theory. Prerequisite: 99 (3S)

130. Advanced Calculus. Prerequisite: 100 (3F)

131. Advanced Calculus. Prerequisite: 130 (3W)

132. Advanced Calculus. Prerequisite: 131 (3S)

145. Vector Analysis. Prerequisite: 118 (3F)

150. The Teaching of Mathematics in the Elementary and High School. (3F or S)

153. Mathematical Readings. Prerequisite: 123 (3S)

246. Tensor Analysis. Prerequisite: 145 (3W)

254. Theory of Functions. Prerequisite: 132 (3F)

255. Theory of Functions. Prerequisite: 254 (3W)

256. Theory of Functions. Prerequisite: 255 (3S)

257. Advanced Applied Mathematics for Physicists, Chemists and Engineers. Prerequisite: 132 (3F)

258. Advanced Applied Mathematics for Physicists, Chemists and Engineers. Prerequisite: 257 (3W)

259. Advanced Applied Mathematics for Physicists, Chemists and Engineers. Prerequisite: 258. (3S)

DIVISION OF STATISTICS

Degree: Bachelor of Science in Mathematical Statistics.

The work in Mathematical Statistics has a three-fold purpose:

- (a) to train professional statisticians.
- (b) to instruct students who wish to broaden their mathematical studies or who seek a mathematical background for work in economics, sociology, genetics, biometry, psychology and education.
- (c) to conduct research in statistics and train competent consultants on statistical problems.

Mathematics 99 or its equivalent is required of all students taking statistics in the Division of Statistics.

Students wishing to major or minor in statistics will take the courses 160 to 167 inclusive in the Division of Statistics and Mathematics 122, 130, 131 and 132.

160. Determinant and Matrix Theory. (3F)

161. The Calculus of Probability. (5F)

162. Mathematics of Statistics. (5F)

163. Mathematics of Statistics. (5W)

164. Modern versus Classical Statistical Theory. (3W)

165. The Theory of Errors and Least Squares. (3S)

166. Sequential Analysis and the Control of Quality of Output in Manufacturing. (3W)

167. Statistical Reading and Reports. (3S)

Military and Air Science and Tactics Army and Air Force

Edward W. Timberlake, Colonel CAC, Professor of Military Science and Tactics, Coordinator of ROTC Affairs; Harold E. Cotter, Lt. Colonel USAF, Professor of Air Science and Tactics; Quentin L. Kendall, Lt. Colonel QMC, Assistant Professor of Military Science and Tactics, Director QMC; John S. Sabine, Lt. Colonel CAC, Assistant Professor of Military Science and Tactics, Director Artillery; Alfred B. Banks, Major FA, Assistant Professor of Military Science and Tactics, Executive and Adjutant; Harold D. Higgins, Major CAC, Assistant Professor of Military Science and Tactics; Anker C. Pedersen, Major QMC, Assistant Professor of Military Science and Tactics; Floyd E. Roth, Major USAF, Assistant Professor of Air Science and Tactics; Avery C. Bruce, Captain USAF, Assistant Professor of Air Science and Tactics; Alexander Capasso, Captain QMC, Assistant Professor of Military Science and Tactics; Edward H. Church, Captain CAC, Assistant Professor of Military Science and Tactics; Irvan J. Church, Captain USAF, Assistant Professor of Air Science and Tactics; Harold W. Christy, Captain USAF, Assistant Professor of Air Science and Tactics; Ralph L. Giddings, Jr., Captain FA, Assistant Professor of Military Science and Tactics, Director 1st Year Basic; Joseph W. Lyons, Captain QMC, Assistant Professor of Military Science and Tactics; William Twitty, Captain QMC, Assistant Professor of Military Science and Tactics; James E. Beckett, 1st Lt. CAC, Assistant Professor of Military Science and Tactics; Lloyd R. Pugh, Jr., 1st Lt. USAF, Assistant Professor of Air Science and Tactics; Peter M. Petrov, CWO USAF, Assistant Professor of Air Science and Tactics, Air Force Administrative Assistant.

Francis M. Alix, M/Sgt. FA (DEML), Instructor in Military Science and Tactics, Small Arms Instructor; Marvin L. Brimmer, M/Sgt. FA (DEML), Instructor in Military Science and Tactics, Ordnance Supply NCO; Charles D. Hendricks, M/Sgt. Inf. (DEML), Instructor in Military Science and Tactics, Assistant Instructor MS I; John L. Holland, M/Sgt. QMC (DEML), Instructor in Military Science and Tactics, Assistant QMC Instructor; Samuel L. Packman, M/Sgt. AGD (DEML), Instructor in Military Science and Tactics, Sergeant Major; Jack R. Perry, M/Sgt. USAF,

Instructor in Air Science and Tactics, Administrative NCO; **Harvey R. Wardrop**, M/Sgt. CE (DEML), Instructor in Military Science and Tactics, Supply Sergeant; **Walter B. Speed**, 1st Sgt., USAF, Instructor in Air Science and Tactics, Supply Sergeant; **David L. Chaudron**, Sgt. 1cl Inf. (DEML), Instructor in Military Science and Tactics, Assistant Supply Sergeant; **Jack Howard**, SFC AGD (DEML), Instructor in Military Science and Tactics QMC Administrative NCO; **Val M. Johnner**, SFC Ord (DEML), Instructor in Military Science and Tactics, Ordnance Maintenance NCO; **John L. Owen**, SFC FA (DEML), Instructor in Military Science and Tactics, Assistant Instructor MS IV; **Thomas D. Salyers**, SFC Ord (DEML), Instructor in Military Science and Tactics, Automotive Mechanic; **Joseph C. Hughes**, T/Sgt. USAF, Instructor, in Air Science and Tactics, Air Force Training Aids; **Gordon H. Adkins**, Sgt. CAC (DEML), Instructor in Military Science and Tactics, Assistant Instructor in Artillery; **Frederick H. Hirsch**, AGD (DEML), Instructor in Military Science and Tactics, Artillery Administrative NCO; **Norman J. McGinn**, S/Sgt. USAF, Instructor in Air Science and Tactics, Assistant Administrative NCO.

N. W. Christiansen, Professor of Music, Instructor in Band.

For students who wish to qualify for a Regular Army or Air Force commission, a department major in Military or Air Science and Tactics is offered through the School of Arts and Sciences. In the post-war period the colleges and universities of the nation will be called upon to provide most of the officer personnel needed for the Regular Army, Marine Corps, and Air Force.

Students desiring to major in Military or Air Science and Tactics are required to major in another academic field thereby resulting in a dual major. The purpose of this is to supply the Army or Air Force with specialists in all fields for research and other purposes. It is also additional preparation for the student in the event he is not selected or could not qualify for a Regular Commission.

For those students who are not following a prescribed course as in Engineering or Forestry the following general subjects are recommended for the prospective Army or Air Force Officer:

Exact Sciences: Mathematic, Physics, Chemistry.

Language and Arts: English, Languages (two years), Speech.

Social Sciences: American History, Psychology, Political Science.

For students who desire a dual major in Military or Air Science and Tactics the following majors are recommended, but not required:

Antiaircraft Artillery: Chemistry, Mathematics, Modern Languages, Physics, School of Engineering and Technology.

Quartermaster: School of Arts and Sciences, School of Agriculture, School of Commerce, School of Forestry.

USAF Administration: Business Administration, Physical Education, Secretarial Science, Pre-Medical, Pre-Dental, School of Agriculture, All other Majors.

USAF Air Installations. Choice of one of the following majors required: Civil Engineering, All other Engineering and Technology, Forestry, Landscape Architecture.

USAF Communications. Following majors required: Radio Technology, Electrical Engineering, Any other Engineering and Technology.

REGULAR ARMY AND AIR FORCE COMMISSIONS

Under authority granted in AR 60-57, the PMST is authorized to appoint as "Distinguished Military Graduates" such graduating students as are deemed worthy of commendation by both the President of the College and the PMST or PAST.

Under the provisions of Army Regulation 605-7, students designated as "Distinguished Military Graduates" are authorized to apply for direct commissions in the Regular Army and Air Force of the United States. Approximately fifty such commissions are available to students of this College each year.

Under the provisions of War Department Circular 20, 1947, students who receive reserve commissions are authorized to apply for a "Competitive Tour" of active duty to last for a period of two years. From each group of reserve officers who enter on these "Competitive Tours" a certain number are given commissions in the Regular Army and Air Force. It is estimated that approximately fifteen hundred such commissions will be awarded annually, throughout the nation.

Two years of military training (six credits) are required of all qualified male students at the College. Students are normally required to complete the basic course during the first and second years at the Institution.

See Military and Air Science and Tactics Department, separate section, for course descriptions and other details.

Modern Languages and Latin

George A. Meyer, Professor; **George C. Jensen**, Professor Emeritus; **Thelma Fogelberg**, **Marion L. Nielsen**, Associate Professors; **Aldyth Thain**, Assistant Professor; **Jesse G. Nelson**, **Gordon E. Porter**, **Miquette R. Nelson**, Instructors.

Intensive elementary language courses are designed for students who wish to acquire a speaking as well as a reading knowledge of the language in a shorter space of time than required for the standard elementary courses. One hour daily is used for lecture and one hour for drill in oral-aural training. The equivalent of the standard first year of modern language is completed in two quarters. Special courses for advanced work are provided for those who have satisfactorily completed the intensive two quarters course.

Standard 5 credit elementary courses are provided for those whose aim is primarily a reading and some speaking knowledge of a foreign language and the satisfying of language requirements.

No credit in a beginning language may be used towards graduation until at least 14 credits have been accumulated.

Major in a modern language: (Prospective majors are advised to enroll in the intensive courses.)

French: The following courses are required: 1, 2, 3, 101, 102, 105, 110 and twelve credits numbered above 110.

German: Forty-five credits including 1, 2, 3, 101, 102, and fifteen credits from courses numbered above 103.

FRENCH

1A, 2A. Elementary French. Intensive Course. Two hours daily. (7F. 7W)

**Meyer
Staff**

1, 2, 3. Elementary French. (5F. 5W. 5S)

101A. Intermediate French. Intensive course. (5S)

**Meyer
Staff**

102A. Intermediate French. (5F)

101. Intermediate French. (5F)

**Meyer
Thain**

102. Intermediate French. (5W)

105. Advanced Composition and Conversation. (3W)

Fogelberg

106, 107, 108. Selective Reading. Open to students who have completed French 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2F. 1-2W. 1-2S)

Staff

109. French Short Story. A study of the French Conte as a literary form from the earliest times. The course serves as an introduction to literary movements in France. Special emphasis on the 19th century. (3S)

Meyer

110. French Phonetics. Principles of French pronunciation and their practical application. (3F)

Meyer

112. 19th Century French Poetry. (3W)

Thain

120. **The Comedies of Moliere.** Moliere's plays as social criticism. (3F) **Meyer**
 121. **French Classic Drama.** Plays of Corneille and Racine. (3W) **Staff**
 122. **Nineteenth Century French Drama.** The Romantic and Realistic Schools. (3S) **Fogelberg**
 125. **Survey of French Literature.** (3S) **Thain**
 129, 130. **French Literature of the 18th Century.** Special emphasis on the philosophy of the period—Voltaire, Rousseau, Buffon, Diderot. (3F. 3W) **Meyer**
 131. **The Comedies of Beaumarchais and Marivaux.** (3S) **Staff**
 135, 136, 137. **Nineteenth Century French Novel.** (3F. 3W. 3S) **Fogelberg**

GERMAN

- 1A, 2A. **Elementary German.** Intensive Course. Two hours daily. (7F. 7W) **Staff**
 1, 2, 3. **Elementary German.** (5F. 5W. 5S) **Staff**
 101A. **Intermediate German.** Intensive. (5S) **Staff**
 102A. **Intermediate German.** (5F) **Staff**
 101. **Intermediate German.** (5F) **Staff**
 102. **Intermediate German.** (5W) **Nielsen**
 105. **Advanced Composition and Conversation.** (3W) **Staff**
 106, 107, 108. **Selective Readings.** Open to students who have completed German 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2F. 1-2W. 1-2S) **Staff**
 110, 111, 112. **Scientific German.** Reading of scientific texts. Reports. (2F. 2W. 2S) Open to students after completion of 101 or equivalent. **Nelson**
 120. **Die deutsche Novelle im 19. Jahrhundert.** Reading and discussion of representative stories by Hauff, Storm, Heyse, Meyer, Keller and others. (3F) **Staff**
 121. **Lessing—Plays and Biography.** (3) **Staff**
 122. **Schiller—Poetry, Plays and Biography.** (3S) **Staff**
 123. **Die deutsche Novelle im 20. Jahrhundert.** Representative stories by Thomas Mann, Heinrich Mann, Herman Hesse, Schnitzler and others. (3) **Staff**
 125. **Survey of German Literature.** (3S) **Staff**
 130. **Goethe's Faust.** Prerequisite: Two years of college German or equivalent. (3W) **Staff**
 131. **Goethe's Prose.** Werther, Dichtung und Wahrheit, and selections from Wilhelm Meister. Reading of a biography of Goethe. (3S) **Staff**
 132. **Heine's Poetry and Prose.** (3F) **Staff**
 133. **German Drama of the Nineteenth Century.** Rapid reading and discussion of representative plays from Kleist to Hauptmann. (3) **Staff**
 150. **Schnitzler's Stories and Plays.** (3) **Staff**
 151. **Hauptmann's Plays and Novels.** (3) **Staff**
 153. **Thomas Mann—Novels, Novellen and Essays.** His life and philosophy. The course is conducted in English and readings are in translation. Either German or English credit is given. (3) **Nielsen**

SPANISH

- 1A, 2A. **Elementary Spanish.** Intensive Course. Two hours daily. (7F. 7W) **Fogelberg**
 1, 2, 3. **Elementary Spanish.** (5F. 5W. 5S) **Staff**
 101A. **Intermediate Spanish.** Intensive Course. (5S) **Fogelberg**
 102A. **Intermediate Spanish.** (5F)

101. Intermediate Spanish. (5)
 102. Intermediate Spanish. (5) Fogelberg
 105. Advanced Composition and Conservation. (3W) Fogelberg
 106, 107, 108. Selective Readings. Open to students who have completed Spanish 102 or its equivalent. Readings and reports in various fields, scientific or literary. (1-2F. 1-2W. 1-2S) Staff
 125. Survey of Spanish Literature. (3S) Staff

PORTUGUESE

- 1, 2, 3. Elementary Portuguese. Grammar, dictation, conversation and reading. Study of the history and culture of Brazil and Portugal. (5F. 5W. 5S) Meyer
 101, 102, 103. Second Year Portuguese. Grammar, reading, conversation and composition. Credit arranged. (F. W. S) Meyer
 106, 107, 108. Selective Readings. One or two credits. (1-2F, 1-2W, 1-2S) Meyer

LATIN

- 1, 2, 3. First Year Latin. Special emphasis on the relation of Latin to English. Study of vocabulary and word-formation as an aid to better comprehension of our own tongue. Especially recommended for English majors and for pre-law and pre-medical students. The course includes readings from Caesar. (5F. 5W. 5S) Thain
 101, 102, 103. Virgil and Cicero. Selected readings from the orations of Cicero and Virgil's Aeneid. Miscellaneous readings from other Roman authors. Open to all students who have had one year of college Latin or two years of high school Latin. (3F. 3W. 3S) Nielsen
 104, 105, 106. Selective Readings in Latin. (2F. 2W. 2S) Nielsen

SPECIAL SERVICE COURSES

21. French Pronunciation. Primarily for students in Music, Art, Speech, and Radio. Available to others. Basic drill on pronunciation with special attention to the terminology and proper names encountered in music and art. (2W)
 22. Italian Pronunciation. Same as for course 21. (2F)
 23. German Pronunciation. Same as for course 21. (2S)
 80. Medical Latin. (3F)
 81. Medical Greek. (3W)

Physics

Willard Gardner, Professor Emeritus; Rolland Perry, Professor; Philip J. Hart, Associate Professor; Jay O. Jensen, Assistant Professor.

Requirements of Physics Majors: 45 credits, of which 30 credits must be upper division courses, (numbers above 100). Certain approved courses in upper division Engineering and Radio Technology, not to exceed 10 credits may be counted.

Suggested courses: The course taken will depend on whether the student wishes to continue with graduate work in Physics or whether he desires to teach in high school. The following sequence of courses is recommended particularly for those who wish to continue in graduate study. Students desiring to complete a teaching major in Physics in preparation for secondary school teaching, or

those desiring to take courses in physics as part of a composite teaching major should consult with the head of the department for specific recommendations. Required professional education courses for the teaching certificate are listed in the School of Education.

Freshman Year: Math. 35, 46, 97; Chem. 3, 4, 5; Bacteriology 1; Economics 51; 5 credits Social Science.

Sophomore Year: Physics 20, 21, 22; Math. 98, 99, 100; English 10; German 1, 2, 101.

Junior Year: Physics 120, 121, 130, or Physics 175, 176, 177; Math. 122, 119, 120; English 110; 5 credits Biological Science; German or French.

Senior Year: Physics 153, 154, 185, 186, 187, 193, 194, 195; one year course in Physics; Math. 130, 131, 145; Chem. 104, 105, 106. Language group electives.

A Teaching Minor in Physics is approved only for students majoring in closely related fields. Such students must complete Physics 20, 21, 22, and at least 3 hours of upper division work.

Master of Science Degree in Physics

Candidates for the degree of Master of Science in Physics must present general physics, general chemistry, calculus, one additional year of mathematics, and courses at the upper division level in five of the following areas: Mechanics, Heat and Thermodynamics, Geometrical and Physical Optics, Electricity and Magnetism, Modern and Nuclear Physics, Meteorology, Physical Chemistry, Electronics, Soil Physics. In cases where the candidate has less than six credits in one or more of the five fields he may be requested to take additional work in these areas as part of the work for the Master's Degree.

1. Household Physics. Designed primarily for Home Economics Majors. Covers selected topics in Physics of practical importance in the household, with heat and electricity receiving greatest emphasis. Four lectures, one lab. (5W)

Jensen

3. Introductory Physics. A non-technical course designed for students who do not expect to major in sciences but who want a knowledge and understanding of the fundamental physical principles and their applications. (5F, W or S)

Jensen

6, 7. General Physics. Physics 6 covers mechanics, constitution of matter heat, and meteorology. Physics 7 emphasizes electricity and magnetism, with a survey of light and sound. Primarily designed for students in Forestry and Agriculture. (Physics 6, 5 credits F or W; Physics 7, 5 credits S)

Jensen

16. Introductory Meteorology. A non-mathematical treatment of fundamental physical laws governing the atmosphere and its phenomena. A brief study of the polar-front theory, air-mass analysis, weather map reading, and forecasting. This course covers information required by the Civil Aeronautics Administration for flying. (3F)

Jensen

20, 21, 22. Mechanics and Molecular Physics. Electricity and Magnetism. Heat, Sound and Light. For Science majors, Engineers, and students preparing for Medicine. Recommended for majors in Agriculture who intend to do graduate work. Prerequisite: Math. 44 or 46. Students should take this in the sophomore year. Three lectures, two labs and two quiz sections per week. (5; 5F, 5W, 5S)

Perry, Hart

31, 32. Physical Science. Principles essential to understanding of physical universe. Elements of basic physical sciences integrated for use in interpreting human experience. Intended to meet the Physical Science group requirements upon completion of both quarters' work. (5W, 5S)

t.b.a.

UPPER DIVISION

Calculus and Physics 20, 21, 22 are prerequisite for all courses numbered above 100. Math. 122 should be taken as early as possible.

Physical Chemistry. See Chemistry 104, 105, 106 and Chemistry 109, 110, 111.

Soil Physics. See Agronomy 214.

117. General Meteorology. (Physics of the Air.) Atmospheric physics and weather phenomena from both the dynamic and synoptic procedures. A brief study of meteorological apparatus, observations, map reading, forecasting and including all the basic principles of aeronautical meteorology. Prerequisite: Physics 6 or 22 and Calculus. Four lectures, one lab. (5S) **Jensen**

120, 121. Modern Physics. (Recommended for Juniors.) A study of electrons, ions, atomic structure and radiation. (3F. 3W) **Hart**

130. Nuclear Physics. (To follow Physics 121.) A survey of methods and results of recent investigations of nuclear processes. (3S) **Hart**

140. Biophysics. Principles of electricity, light, x-rays and radioactivity as related to studies in Biology. (5F) **Staff**

153, 154. Analytical Mechanics. Prerequisite: Differential Equations. (3W. 3S) **Perry**

160. Heat. The nature, transmission, effects, and theories of heat. (3W) **Hart**

161. Thermodynamics. A short introduction to thermodynamics. (3S) **Hart**

166, 167. Geometrical and Physical Optics. (3F. 3W) **Hart**

175, 176, 177. Electricity and Magnetism. Electrostatics, Magnetostatics, D.C. and A. C. circuits, Electromagnetism, and Electromagnetic Theory. Making use of the Calculus and Differential Equations. (3F. 3W. 3S) **Perry**

182. Electronics. The concept of the electron, its relation to the structure of the atom, to the conducting of electricity, to ionization, to photoelectric and thermoelectric effects, etc. Emphasis is placed on the design and construction of electronic measuring equipment for the modern research laboratory, for communication, and for the numerous controls in the modern factory. Three lectures, one lab. (4) **t.b.a.**

185, 186, 187. Physical Measurements. A laboratory course to give the advanced student experience with precision measuring instruments and their use in Physics. Work includes measurements in Electricity and Magnetism, Heat, Optics and Spectroscopy, Atomic and Nuclear Physics, etc. Recommended for seniors. (2F. 2W. 2S) **Staff**

193, 194, 195. Seminar in Physics. A weekly meeting of staff and physics majors, consisting of reports on recent developments in Physics. Students may register and receive credit for course by making reports. All upper division physics majors are expected to attend whether registered for the course or not. (1F. 1W. 1S) **Staff**

GRADUATE COURSES

Courses numbered above 200 may be taken by undergraduates only with the approval of the instructor and the head of the department.

285, 286, 287. Introductory Quantum Mechanics. Prerequisite: Advanced Calculus. (3F. 3W. 3S) **Perry**

290, 291, 292. Theoretical Physics. (3F. 3W. 3S) **t.b.a.**

293, 294, 295. Seminar in Physics. (1F. 1W. 1S) **Staff**

250. Research in Physics. Credit to be arranged before registration. (F, W, S) **t.b.a.**

210. X-Ray Diffraction. (3) **Staff**

211. X-Ray Crystallography. (3) **Staff**

220. Atomic Spectra and Atomic Structure. (5W) **Staff**

230, 231. Nuclear Physics. (3W, 3S) **Staff**

Upon sufficient demand certain other courses may be offered.

Speech and Drama

Chester J. Myers, Professor; **Rex E. Robinson**, **Floyd T. Morgan**,* **Harold I. Hansen**, Associate Professors; **E. LeRoi Jones**, **Burrell F. Hansen**, Assistant Professors; **Stuart Hardman**, **Gwendella Thornley**, **Willis M. Rosenthal**,
Instructors.

*On leave.

The requirements of forty-five credit hours for a departmental major or a teaching major in Speech are as follows: Speech Foundations (Sp. 8) 2 credits; courses in Public Speaking, 8 credits (Speech 125 required of all majors); courses in Interpretation, 8 credits (Speech 124 required of all majors); courses in Drama, 8 credits (4 credits in Speech 150 required of all majors); courses in Speech Correction, 5 credits (Speech 167 required of all majors); courses in Radio, 6 credits (Radio Production required of all majors); Elective courses in Speech, 8 credits. In addition, courses in Dramatic Literature, 5 credits, and Teaching of Speech, 2 credits, are to be recommended by the Department Head according to student needs.

English courses 48, 56, 163, 164, 168, 186, 187, or Speech 160, 162, 164 may be used for credit toward the departmental requirement in dramatic literature.

For the Composite English-Speech Major students will be required to have the following speech courses: Public Speaking, 8 credits; Interpretation, 8 credits; Drama, 8 credits; Speech Correction, 5 credits; Radio, 3 credits; Teaching of Speech, 2 credits. For a distribution of these courses see first paragraph above.

Master of Science Degree

The Department of Speech offers opportunity for research and graduate study leading to a Master of Science degree in the following specialized fields: Speech science, interpretation, theatre, public address and radio.

The following courses may be modified and used for graduate credit by students majoring in the Speech Department or by students in other departments: 107, 108, 109, 110, 111, 123, 124, 125, 145, 150, 154, 171, 173, 181, 182, 184, 185, 186, 192.

1. Public Speaking. (Formerly Fundamentals of Speech) Elementary training in Public Speaking. Includes training in daily speaking situations, voice improvement. Clinic assistance available to students who need it. Time for clinical assistance to be arranged. Credit is not given to students who have taken Speech 5. (5F, W or S) **Staff**

4. Principles of Reading. The principles of effective oral and silent reading. Emphasis on oral delivery of literary selections. A preparatory course for understanding and appreciation of the printed page. Practice material includes not only standard literature, but also everyday reading matter. (5F, W or S)

Thornley, B. Hansen

5. Extempore Speech. Designed to meet the specific needs of professional people in the practice of their profession. Basic principles of effective speaking, with emphasis on preparation and delivery of forms and address of greatest interest to those for whom the course is provided. Credit will not be given to students who have taken Speech 1. (3F, W or S) **Staff**

7. Basic Principles of Voice and Phonetics. A training course, adapted to individual needs and abilities. Exercises for flexibility of voice articulation, and pronunciation. Recommended for all Speech majors and minors, for prospective teachers, and other courses in public speaking and oral interpretation. (3F) **Jones**

8. Speech Foundations. Required of all Speech majors in their sophomore year. This course is designed for students desiring information regarding all phases of speech and drama, and what prospects the fields hold for possible majors and minors. The Speech Staff appears before the class for lecture and discussions. This is not a performance course, but rather a survey. Areas in the speech field to be discussed include acting, directing, and technical work of the theatre, speech correction, radio oral reading and interpretation, public speaking and forensics. (2S) **H. Hansen and Staff**

9 or 109. Public Discussions. Application of various group discussion techniques to current problems. Efforts are made to have some of the discussions presented to various civic and religious organizations, or to release them over a commercial radio station. (3S) **Robinson**

11. Speech for the Foreign Students. The class is designed to help foreign students with conversational and technical vocabulary development. (3 F. W. or S.)

12 or 112. Private Instruction. Individual attention given in private to particular needs of the student in an effort to eliminate personal defects, develop skill, and solve individual speech problems. Recommended for anyone needing individual speech instruction and to speech majors. Special fee. Any quarter. May be taken more than one quarter. Credit arranged. **Staff**

13 or 113. Argumentation. For the student desiring a background of information and practice in the techniques of analysis, investigation, evidence, reasoning, brief making, refutation, and the construction and delivery of the argumentative speech. Students present argumentative speeches, including class debates. Required of those wishing credit for Speech 15 or 115, Intercollegiate Debating. (3F) **Robinson**

15 or 115. Intercollegiate Debating. Members of the debating squads may receive not more than three credits in any one year. Credit is granted only to those with credit in Speech 13 or 113, Argumentation. (3F, W or S) **Robinson**

16. Dialect. The most prominent dialect forms, their principles and uses. The dialect work of such writers as Burns, Kipling, Drummond, Riley, Dunbar, Harris, and Kirk is studied, discussed and learned. (3S) **Myers**

18 or 118. Story-telling. The story as an educational factor, analysis and classification of typical stories with references to each period of the child's development. Study of courses: adaptation of material; and actual practice in story-telling. Consideration is given stories of western pioneer life. The work is designed to meet the needs of student, teacher, recreation leader, church activity leader, librarian, and parent. (5F, W, or S) **Myers**

20 or 120. Playground Dramatics and Pageantry. For those interested in studying principles involved in playground dramatics, make-up, pageantry, story-telling, and related activities. (3W) **Myers**

21. Advanced Public Speaking. Training in handling special and more complex speaking situations. Emphasis on developing skill in speech presentation. Prerequisite: Speech 1 or 5. (3F, W or S) **Robinson**

24. Oral Interpretation: Lecture and Recital. Various literary forms are studied for platform presentation. Reading from manuscript and from memory. Preparation and presentation of public recital in reading. (3F) **Myers**

26 or 126. Make-up. Straight and character make-up. For Speech and Music majors and minors, MIA workers and prospective teachers. Theory and practice in the art of make-up. (1F) **H. Hansen**

28 or 128. Make-Up. Nationals: Negro, Oriental, and special problems in make-up. It is suggested that students complete 26 or 126 before taking this course. (1S) **H. Hansen**

44. Fundamentals of Acting. Problems of terminology, interpretation of role, and body movement. (3F) **H. Hansen**

60. Drama Appreciation. An introduction to the understanding and enjoyment of dramatic literature, radio drama, and moving pictures. Selected readings of dramatic masterpieces and other contributions to the theatre. (5W) **H. Hansen**

67 or 167. Introduction to Speech Correction. Required of all Speech and Speech Correction majors and those taking a composite Speech and English major. It is suggested as an elective for majors in Psychology. This is the first course in speech correction, dealing with common speech defects and remedial measures for problems in lisping, indistinct pronunciation, foreign accent, delayed speech, stuttering, and inappropriate use of the voice. Not open to graduate students. (5F) **Jones**

73 or 173. Speech Clinic. Application and discussion of methods applied to speech correction in the clinic. Training and practice through the supervised handling of selected cases. Students who have had one quarter of experience

are allowed to participate in extension clinics. Prerequisite or corequisite: Speech 167. Consult the instructor for permission to register. Not open to graduate students. Any quarter. Credit arranged. **Jones**

75. Remedial Speech. This course is intended for those who have a noticeable difficulty with speech, in articulation, quality, pitch intensity, or rhythm. Time arranged. Consult Instructor before registering. **Jones**

81. Introduction to Radio. Survey of radio station and network operations, organization, and programming. Attention is given to developing an understanding of radio as a factor in our social organization, and to developing an appreciation in selection of programs. **B. Hansen**

82. Radio Speech. Analysis and development of the speech skills and speech forms as applied to radio. Development of acceptable standards of voice and articulation for radio presentation is emphasized. Effective organization and presentation of the various speech types utilized on the air—announcements, talks, program continuities interviews, round-tables—are included. (3F) **B. Hansen**

83. Elements of Broadcasting. A study of the various aspects of broadcast programs with practice in each. Writing and presentation of commercial continuity, news, musical programs, drama, and special events, is carried out. (3W) **B. Hansen**

84. Control Room and Studio Operations. Study of basic studio and control room equipment with regard to function, placement, operation and care. 1 hour lecture and 2 hours of lab. per week. Registration only by instructor's permission. (2F) **B. Hansen**

106. The Current and Recent Broadway Theatre. Discussion, lecture, and reading of the more recent plays that have been presented on Broadway. An analysis of the play, cast, and staging, including professional critical reviews. (2F) **H. Hansen**

107. Speech Hygiene. Techniques of normal speech and development of normal and abnormal speech. Major consideration given prevention and correction of speech abnormalities. Primarily designed to satisfy speech hygiene needs of elementary school teachers. Recommended for all secondary teachers but does not fulfill the speech pathology requirement for Speech majors. (3W) **Jones**

108. Interpretation: Scene and Play Reading. Instruction for readers of plays. The classics as well as modern plays are to be used. (3W) **Myers**

110. Public Programs. Types of interpretive material suitable for presentation before various kinds of audiences. Reading of short stories, plays, and novels to determine suitability. The cutting of various types of material to suitable form and length for public reading. (2S) **Myers**

111. The Psychology of Speech. The principles of psychology which underlie speech. Problems considered include the nature and origin of speech, language in the child and the psychology of the audience. (3S) **Jones**

114. Writing for Radio. (3S) (See Journalism Division)

123. Teaching of Speech. (Education 123) The methods and problems peculiar to the teaching of speech. A study of the organization of courses and lesson plans is included. Students may register only with the permission of the instructor. (2F) **Myers**

124. Advanced Interpretation. The mastering of significant selections from the great writers. The student grows in power to interpret permanent literature. Reading from manuscript and from memory. (5S) **Myers**

125. Speech Composition. Advanced theory and practice of public speaking. Students build and deliver several short speeches and read selected masterpieces from the world's public speaking literature. Prerequisite: Sophomore standing, and Speech 1 or 5. (5W) **Robinson**

144. Advanced Acting. Problems of characterization, tempo, and more advanced body movement. Analysis of the role. (3W) **H. Hansen**

146. Stage Directing. The fundamental principles of directing plays, musical comedies, pageantry, opera, and the dance. Theory and practice. (3S) **H. Hansen**

150. Drama Production. Principles, procedures, and materials of play production. Scene design and construction, scene painting, lighting, costuming, management are studied and principles learned are applied to the presentation

of plays. Students are assigned to work crews in Utah State Theatre productions. (2-3 F)

152, 154. Drama Production Laboratory. Application of principles studied in Speech and Drama 150. Four hours per week of crew and staff work on Utah State Theatre productions. (2W and S)

Staff

156. The One Act Play. Study and analysis of selected one act plays. A course recommended for students who will become community, school, or church drama directors. (2S)

Staff

158. Children's Theatre. Creative dramatics, for children. Educational dramatics for students who wish to prepare to direct children in dramatic work. A study is made of plays suitable for primary and intermediate schools. Courses in dramatics are outlined, stories dramatized, and plays produced. The College Training School affords opportunity for this work. Of special interest to prospective elementary school teachers. Consult instructor before registering. (3-5F)

Myers

160. Dramatic Structure. Study and analysis of dramatic structure and technique. For students interested in direction, dramatic literature and playwriting.

Morgan

162. Masterpieces of Drama and the Theatre. Selected dramas from the Greek period to Ibsen. Plays are analyzed and discussed from points of view of the producer, director, and actor. Not prerequisite to Speech and Drama 164. (2W)

Staff

164. Masterpieces of Drama and the Theatre. A continuation of Speech and Drama 162. Selected Continental, British and American dramas from Ibsen to the present. (2S)

Staff

170. Drama Analysis and Theories of the Stage. For a clearer understanding of the theatre's place as an institution, and its responsibilities. A lecture and discussion course relating theatre to other arts, in a modern world; the relationship of the actor, director, painter, and author to the audience.

H. Hansen

171. Speech Pathology. Advanced course in speech correction. Speech involvements of pathologies of the larynx, mouth, ears, and brain. Disorders such as pathological voice defects, cleft palate, difficulties in hearing and deafness, aphasia, and spastic speech receive particular attention. Prerequisite: Speech 167. (3S)

Jones

181. Radio Production. Study and studio practice in the problems in directing and producing various kinds of broadcasts. Planning of programs, casting and rehearsal procedures, coordination of technical aspects of production, and problems in special studio effects are considered. Registration is limited to Juniors and Seniors.

B. Hansen

182. Radio Newscasting and Writing. Offered for credit in both Speech and Journalism departments. Study and application of principles of editing, organizing, writing and presenting news by radio. Three periods a week devoted to discussion and practice in writing and arrangement; two periods a week meetings are held in the studios for analysis and presentation of news over the microphone. (5S)

Andersen, B. Hansen

183. Radio Programming for the Rural Audience. A course designed for people whose interests or vocations are concerned with rural life. Particularly recommended for County Agents, 4-H workers, Home Demonstration Agents, Extension workers, and Conservation workers. Analysis and discussions of farm and home needs which radio can serve. Design, writing and production of varieties of programs of interest and value to farm listeners.

B. Hansen

184. Radio Programming for Children. Objectives and principles of radio programs for children are studied. Various types of programs for children of different ages will be developed, written and produced. (3W)

B. Hansen

185. Advanced Radio Production. This course follows 181 and will deal with more specialized production problems such as remote pick-ups, integration of recorded with live material, network and local studio coordination, documentary productions, dramatic problems and special events. Prerequisite 181. (3S)

B. Hansen

186. Radio Training. Enrollment limited to students best qualified by training and ability for actual broadcasting experience on a commercial station. Students

so qualified as indicated by their collegiate record and by an audition are allowed to register for from 3 to 5 credits. Students thus selected serve an apprenticeship on a local station under direction of the station staff in executing duties which a regular staff employee is expected to perform. Students render three hours' service per week at the station for each registered hour of credit.

B. Hansen

190. Problems in Speech and Drama. Especially selected work, individually assigned, handled and directed in consultation with the student. Special Speech problems of merit and of mutual interest to students and instructors are investigated and reported upon in this course. Consult the instructor for permission to register. Any quarter. Credit arranged.

Staff

GRADUATE COURSES

200. Seminar in Speech. Emphasis on the various fields of Speech. Research problems. (2F or W) **Staff**

201. Thesis. Prerequisite: Graduate standing. (2-5 F, W or S) **Myers and Staff**

202. Seminar in Theatre. Prerequisite: Graduate standing. (2F, W or S) **Morgan, Hansen and Staff**

203. Seminar in Public Speaking. Prerequisite: Graduate standing. (2F, W or S) **Robinson and Staff**

204. Seminar in Interpretation. Prerequisite: Graduate standing. (2F, W or S) **Myers and Staff**

205. Seminar in Speech Science. Prerequisite: Graduate standing. (2F, W or S) **Jones and Staff**

206. Seminar in Radio. Prerequisite: Graduate standing. (2F, W, or S) **B. Hansen and Staff**

207. Experimental Phonetics. Prerequisite: Graduate standing. The course aims, first, to present principles involved in the scientific analysis of speech and voice; second, to describe the major laboratory instruments and techniques in current use; third, as far as possible, familiarize the student with actual laboratory practice. **Jones**

208. Experimental Phonetics. A continuation of Speech 207. **Jones**

209. Voice and Articulation Disorders. Prerequisite: Graduate standing. Theory and practice of voice and articulation retraining. Practice in examination diagnosis, and treatment, attention to the problems of both children and adults. Review of studies relevant to the field. **Jones**

210. Problems of the Producing Director. Problems of Educational Theatre and Community Theatre management. The following problems are investigated and discussed: Community Theatre organization and publicity; Community Festivals; Programming; Budgets and Finances. (3S) **H. I. Hansen**

290. Research Studies. Advanced research problems in Speech and Drama. By permission of instructors. Any quarter. Credit arranged. **Staff**

292. Projects in Theatre. Advanced work in scene design, costume design and construction, technical practice, stage lighting, directing, theatre management, makeup. Projects may be part of major productions of the Utah State Theatre or they may be independent endeavors. By permission of instructors. Any quarter. Time and credit arranged. **Morgan, Hansen, Hardman**

Zoology

ZOOLOGY, ENTOMOLOGY, PHYSIOLOGY, AND NURSING

Administered jointly by the School of Agriculture
and the School of Arts and Sciences

C. J. Sorenson, Emeritus Professor; **D. M. Hammond**, **G. F. Knowlton**, **Clyde Bid-dulph**, **Eldon J. Gardner**, **William F. Sigler**, Professors; **J. Sedley Stanford**, **G. H. Kelker**, Associate Professors; **Merrill Gunnell**, **T. L. Bahler**, Assistant Professors; **Gene H. Linford**, Instructor; **Howard E. Dorst**, **F. V. Lieberman**, **G. E. Bohart**, **H. F. Thornley**, **George H. Kaloostian**, **Walter E. Peay**, **S. J. Snow**, **William P. Nye**, Collaborators in Research, U. S. D. A.

For a major in Zoology the following courses must be taken; Zoology 3, 4, 107, 112, 116 or Entomology 115, 118 or 119; 127 or 128, 131; Entomology 13 and Physiology 121, 122. Also the following courses are recommended: Mathematics 34, 35, 44; Agronomy 131, 132; Chemistry 3, 4, 5, 121, 122; Physics 20, 21, 22; Botany 24, 25; Bacteriology 1, 2 or 70, 71, Geology 1, 2. For students planning to do post graduate work leading toward the Ph.D. degree, at least one year of French or German is also recommended.

For a pre-medical major in Zoology, the pre-medical requirements listed in the introduction to the School of Arts and Sciences must be completed, and in addition the following courses must be taken: Zoology 107, 112, 127 or 128, 129, 131, 116 or Entomology 115.

Master of Science Degree

The Zoology, Entomology, Physiology, and Nursing Department offers work leading toward the Master of Science degree in various phases of agricultural entomology, genetics, medical entomology, physiology, taxonomy, parasitology, mammalogy, and ornithology.

The following courses are acceptable for graduate credit for Master of Science Degree candidates in the Department: Zoology 107, 112, 113, 114, 116, 118, 119, 127, 131; Entomology 103, 104, 109, 156; Physiology 121, 122, 123, 160, 180.

The following courses may be used for graduate credit by students majoring in other departments: Zoology 107, 112, 113, 114, 116, 117, 118, 121, 127, 131; Entomology 101, 103, 104, 108, 109, 115, 138, 156; Physiology 121, 122, 123, 160.

ZOOLOGY

1. Principles of Biology. Basic principles of life as illustrated in plants and animals, with emphasis on concepts of fundamental importance, including organization of living things, energy relationships, growth, relation to environment, kinds of living things, reproduction, development, inheritance, and evolution. For lower division students, except those who elect Botany 24, 25, or Zoology 2 or 3 and 4. (5F, W or S) **Gunnell**

2. General Zoology. A brief survey of the more important groups of animals, including the organization, behavior, reproduction, classification and relationships of each group. The basic principles of greatest importance in Zoology receive consideration. This course is especially designed to meet the needs of students in Agriculture and Forestry for a basic course in Zoology. Three lectures, two labs. (5F or S) **Staff**

3. Invertebrate Zoology. An introduction to the invertebrate animals. Classification and relationships, structural characters, function and development are emphasized. Some attention is also given to parasitism. This course is well adapted for premedical and preidental students, Forestry (Wildlife) majors, and others who desire a comprehensive introduction to the animal kingdom. Three lectures, two labs. (5F or W) **Staff**

4. Vertebrate Zoology. The vertebrates, with emphasis on structure, function, evolutionary relationships and some consideration of natural history. (5W or S) **Staff**

106. Zoological Literature. The literature and bibliographies of zoology and entomology. Each student is assigned, or may choose, a report on the literature of some insect or other animal. Prerequisite: two or more of the fundamental courses required of department majors. (1S) **Stanford**

107. History of Biology. The more important men and ideas in the historical development of biology with especial reference to the zoology sciences. (3F) **Staff**

111. Heredity. The facts and principles of inheritance, with emphasis on application to human beings. This includes a consideration of how characteristics are passed from parent to offspring, how the most important human characteristics are inherited, and how the human race as a whole is being influenced in its inherited qualities by various agencies and conditions. It is desirable but not essential that an introductory course in biology, physiology, or botany precede this course. (4F or S) **Gardner**

112. Principles of Genetics. A technical course in the basic principles underlying heredity and variation, and their application to the problems of plant and animal breeding, and human inheritance. Prerequisite: Zool. 2 or 3 and 4, or Bot. 24, 25. Four lectures, one lab. (5F, W or S) **Gardner**

113. Human Genetics. The inheritance of human, physical and mental characteristics, and associated problems. Prerequisite Zool. 111 or 112. (3S) (Given every other year alternating with Zool. 114) **Gardner**

114. Advanced Genetics. An intensive study of the problems of inheritance, with special consideration given to recent and current work in the field. Prerequisite, Zool. 112. (3S) (Given every other year alternating with Zool. 113). **Gardner**

116. Parasitology. The protozoa and worms parasitic in man, domestic animals and wild animals, and relationships between parasites and their hosts are studied. Some consideration is given free-living relatives of parasites. Forms occurring in this general region are emphasized. Prerequisite: Zool. 3. Three lectures, two labs. (5S) **Hammond and Bohler**

118. Vertebrate Embryology. An introduction to the principles of development of the vertebrates, including the formation of gametes, fertilization, cleavage, gastrulation, formation of germ layers, establishment of body form, and organogenesis. In the laboratory the development of the frog, chick and pig is studied. Prerequisite: Zool. 4 or equivalent. Three lectures, two labs. (5W) **Hammond**

119. Comparative Anatomy. The fundamentals of structure of the vertebrate body. The anatomy of typical representatives of each class of vertebrates and the organ systems from the simplest to the most complex forms are studied on a comparative basis. In the laboratory, the shark and the cat are thoroughly dissected. Prerequisite: Zool. 4 or equivalent. Two lectures, two labs. (4S) **Hammond**

121. Ornithology. Bird study planned to acquaint the students with native birds and the class Aves (birds) in general. Identification, relationships, structure, habits, and distribution are studied in classroom, laboratory, and field. Two lectures, two labs. (4S) **Stanford**

122. Mammalogy. Designed to introduce the students to the large and very important class, Mammalia, with particular reference to Utah and North American species. Identification, distribution, structure, habits, and economic importance are stressed. Two lectures, two labs. (4W) **Stanford**

123. Natural History of Animals. The identification, natural history of habits, food, distribution and other features of the more common Utah animals. Also, methods of collection and preparation of specimens for study, display and storage. Major consideration given to insects, birds, and mammals. A considerable amount of laboratory time is spent in making observations in the field, and some longer field trips are taken. Prerequisite: Zool. 1 or 3 and 4. Two lectures, two labs. (4F or S) **Stanford**

127. Cytology. An introduction to the study of cells, with emphasis on chromosomes and their behavior in the development of germ cells. (4W) **Gardner**

128. Elements of Histology. Study of tissues, including characteristics of the different kinds of tissues and the main organs. Two lectures, two labs. (4F) **Bahler**

129. Histological Technique. Techniques employed in making preparations of animal tissues for microscopic study. Three labs. (3S) **Bahler**

131 or 231. Organic Evolution. A critical study of the facts of evolution as obtained from a consideration of comparative anatomy, embryology, geographical distribution, blood tests, and other fields upon which the doctrine of evolution is based. Factors causing evolution are considered and discussions undertaken on other bodies of related thought. Prerequisite: Zoology 1 or 2, or 3 and 4. 111 or 112 recommended. (3W) **Staff**

155. Ichthyology. Ecology, classification, and life histories of native and introduced fishes. Two lectures, one lab. (3W) **Sigler**

160. Animal Ecology. Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. Additional assignment to graduate students. (3F) **Kelker**

199. Minor Problems. Deals with research problems similar to Zool. 201, but intended primarily for undergraduate majors in Zoology. Credit arranged. (F, W or S) **Staff**

201. Special Problems. The student who wishes to engage in some line of original research and is qualified to do so may elect and study some topic in Zoology. Open to undergraduates only by special arrangement with the department. Credit arranged. (F, W or S) **Staff**

205. Methods of Research. For students doing or intending to do original work in some line of Zoology or Entomology, this course offers instruction in selection of topics for research, organization of attack upon problems, methods of finding previously published work, outlining the problem, illustration of the thesis, etc. Required of graduate students who are working for a Master's degree in the department. (1W) **Staff**

217. Advanced Histological Technique. A continuation of Zoology 117 for graduate students, and for students who wish a more thorough and extensive training in the techniques of preparation of biological materials for study. Additional techniques such as the celloidin method, freezing method, embalming and injection of specimens, etc., will be undertaken. Prerequisite: Zool. 117. (2S) **Bahler**

240. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged (F, W or S) **Staff**

221, 222, 223. Seminar. Attendance required of all graduate students in department during each quarter in residence. During each quarter current research in a major field of Zoological Science is discussed by faculty, graduate students and advanced undergraduates. (1F, 1W, 1S) **Staff**

ENTOMOLOGY

For a major in Entomology the following are required: Zoology 3, 4, 106, 107, 111 or 112, 131; Entomology 13, 101, 102, 103, 109, 115, 120, 156. The following courses are recommended: Mathematics 34, 35, 46, 111 or Agronomy 115; Chemistry 3, 4, 5, 121, 122; Physics 21, 22, 23; Botany 24, 25, 30, 130; Range 126; and one basic course in each of the following fields: Agronomy, Horticulture and Vegetable Crops. For students who are planning to do postgraduate work leading toward the Ph.D. degree, at least one year of French or German is also recommended.

For a major in Agricultural Entomology see Department of Zoology, Entomology and Physiology, in School of Agriculture.

13. General Entomology. The structure, classification, interrelationships, and life histories of insects are studied. Some field trips are taken. Three lectures, two labs. (5F) **Stanford**

101. Insect Morphology. Comparative study of insect anatomy with emphasis on structures used in taxonomy. Prerequisite: Ent. 13. Two lectures, two labs. (4W) **Stanford**

102. Systematic Entomology. Each student must collect, properly mount, and label a representative collection of insects containing at least 400 specimens, at least 125 species, and at least 15 orders. The whole collection must be arranged in phylogenetic sequence. Classification must include a correct placing of all specimens in orders. To be taken only with permission of instructor. Prerequisite: Ent. 13. Three labs a week. (3F, W or S) **Knowlton**

103 or 203. Systematic Entomology. Continuation of Ent. 102. The collection arranged for Ent. 102 must be enlarged to at least 700 specimens, 225 species, 100 families, and 18 orders. Classification will include a correct placing of all specimens in families. To be taken only with the permission of the instructor. Prerequisite: Ent. 101. Three labs. (3F, W or S) **Knowlton**

104 or 204. Systematic Entomology. Continuation of Ent. 103. Permission to take this course depends on the student's collection for Ent. 102 and 103. If

his collection justifies further study, he may select one or two orders of insects and classify them to species. To be taken only with the permission of the instructor. Three labs. (3F, W or S) **Knowlton**

105. Forest Entomology. Principal insects attacking forest and forest products. Some attention is also given principles of biological control. A brief study is made of forest vertebrates with emphasis on insect-eating birds. One lecture, two labs. (3F) **Stanford**

108. Agricultural Entomology. Insect pests of major economic importance to agriculture in Utah and the West, including their recognition, type of damage inflicted, distribution, life history, and methods of control. Some field trips for observation of insect pests, their activities and damage. Also demonstrations of mixing and application of insecticides. Primarily for upper division students not majoring in entomology. Three lectures, two labs. (5F or S) **Sorenson**

109 or 209. Advanced Agricultural Entomology. Recognition of important insect pests and their control by chemical, physical, cultural, biological, mechanical, and quarantine methods. Prerequisite: Ent. 13. Three lectures, two labs. (5W) **Staff**

115. Medical and Veterinary Entomology. Arthropods are studied that annoy and transmit disease to man and domesticated and wild animals. Vectors of plague, spotted fever, tularemia, malaria and other Arthropods carrying disease receive major attention. Prerequisite: Ent. 13 or equivalent. Two lectures, two labs. (4W) **Stanford**

120. Insect Pollination in Relation to Agriculture. Primarily to help agriculture students understand role of bees and other pollinating insects in production of seed, fruit, and nut crops. Significance of bee-keeping in general agricultural economy is emphasized. The honey bee is studied as an insect which can be managed by man for pollination and for direct production of useful products. Problems in conservation, increase, and better utilization of pollinating insects are studied. Attention to pollination of commercial crops including fruits, nuts, and oils, and to pollination of seed crops, including legumes, vegetables, ornamentals, medicinals, and fibre plants. Use of insects for pollination in breeding experiments discussed. (2S) **Bohart**

138. Aquatic Entomology. Identification, distribution, life histories and adaptations of aquatic insects are studied with particular reference to local streams and lakes. Two lectures one lab. (3S) **Stanford**

156 or 256. Chemistry of Insecticides and Fungicides. For course description see Chemistry 156 or 256. (2W) **Hill**

199. Minor Problems in Entomology. Research problems similar to Ent. 210, but intended primarily for advanced undergraduate majors in Entomology. Credit arranged. (F, W or S) **Staff**

210. Special Problems. Students may select or are assigned problems dealing with certain phases of Entomology. The amount of credit depends on nature of problem and time spent. Open to undergraduate students only by special permission. Prerequisites: Ent. 13, 103 and 108. Credit arranged. (F, W or S) **Staff**

230. Insects in Relation to Plant Diseases. Important insect vectors of plant disease, their habits, modes of transmission and dissemination of plant diseases. Rearing and handling method, equipment and techniques. Prerequisite: Ent. 13 or 108. Three credits, or four credits with laboratory. (F) **Sorenson**

231. Biological Control of Insect Pests. Biological agents in insect control. Invertebrate parasites and predators, vertebrate predators, and diseases are considered as they relate to suppression or control of insect pests. (3W) **Knowlton**

133 or 233. Introduction to Aphidology. Morphology, biology and taxonomy of aphids are studied. Prerequisite: Ent. 102. (2W) **Knowlton**

234. Readings in Entomology. Assigned readings of advanced nature. Credit arranged. (F, W or S) **Staff**

250. Research and Thesis. For research connected with problem undertaken for partial fulfillment of requirements for Master of Science degree. Credit arranged. (F, W or S) **Staff**

PHYSIOLOGY

For a major in Physiology the following courses must be taken: Physiology 4, 115, 116, 117, 121, 122, 123; Zoology 1, 112, 118, 119, 128, 129 and 131; Biochemistry 191. Also Mathematics 34, 35 and 44; Physics 20, 21 and 22; Chemistry 3, 4, 5, 17, 18 or 115, 121, 122; Bacteriology 70, 71; and at least one year of a foreign language are recommended.

4. General Physiology. For the student who desires a survey of physiology and who is not planning advanced intensive study in the field. It deals with the functioning of the human body with emphasis upon broad general biological principles. (5F, W or S) Staff

20, 21. Human Anatomy and Physiology. A two-quarter course dealing with structure and function of the human body. Physiology 20 is a prerequisite of Physiology 21. These courses are designed for the training of nurses and others requiring a more thorough study of anatomy and physiology than is given in Physiology 4. (4F, 4W) Staff

115, 116, 117. Current Literature in Physiology. Current literature in physiology with oral and written reports. (1F, W, S) Biddulph

121, 122. Mammalian Physiology. An intensive and detailed study of physiology. The function of each of the organ systems of man and animals is studied. Unless special permission is granted, students may not register for the second quarter without having had the first. As preparation, Physiol. 4, Zool. 2, 3, or 4, or Vet. Sci. 20, and a course in physics and chemistry are recommended. Three lectures, two labs. (5F, 5W) Biddulph

123. Endocrinology. The glands of internal secretion, with emphasis on the hormones in reproduction. As preparation, Physiol. 4 or Zool. 1, 2, 3 or 4, or Vet. Sci. 20 are recommended. (3S) Biddulph

131-231. Cellular Physiology. Physiology of the animal cell with emphasis upon mechanisms of synthesis, secretion, and excretion of cellular products. (3S) Biddulph

136-236. Surgical Techniques. Methods and techniques used in laboratory animal surgery. (3W) Biddulph

141-241. Methods of Endocrine Research. Methods used in studying the endocrine glands. Prerequisite: Physiol. 123. (3F) Biddulph

151-251. Radioisotope Technique. Practice in some techniques used with isotopes in studying biological processes. (2-5S) Biddulph

160, 260. Minor Problems. Special investigations in physiology are carried out in this laboratory course. Open to students who have taken Physiol. 121, 122 or who have been granted special permission. (2-5F, W or S) Biddulph

200. Special Problems. Similar to 160 but for graduate students. Credit arranged. (F, W or S)

260. Research and Thesis. Research connected with problem undertaken for partial fulfillment of requirement for Master of Science degree. Credit arranged. (F, W or S) Staff

NURSING

M. Selm, R.N., B.S., Director of Nursing; **A. Aldous, B. S.; R. N. Barlow, M.D.; O. W. Budge, M.D.; Omar S. Budge, M.D.; S. M. Budge, M.D.; W. E. Cragun, M.D.; A. Funk, R.N., B.S.; G. W. Gasser, M.D.; J. Clare Hayward, M.D.; W. H. Hayward, M.D.; M. Houy, R.N.; G. Knight, R.N.; D. Loken, R.N., B.S.; R. O. Porter, M.D.; Z. Reynolds, R.N., B.S.; K. C. Riter, M.D.; L. J. Sessions, B.S.**

Through a joint program offered by Utah State Agricultural college and the Latter-day Saint Hospital of Logan, a student interested in Nursing may earn a B. S. degree in Nursing by enrolling for a fourth year spent entirely at Utah State Agricultural College. Address inquiries to the Division of Nursing at the College, or Director of Nurses, Latter-day Saint Hospital, Logan, Utah.

Courses

Anatomy and Physiology. See Physiology 20, 21. (4F, 4W)

Chemistry. See Chemistry 1. (5F)

Chemistry Laboratory. See Chemistry 2. (2F)

English—Mechanics of Writing. See English 2 (3F, W or S)

Microbiology. See Bacteriology 1. (4F, W or S)

Microbiology Laboratory. See Bacteriology 2. (1F, W or S)

Nutrition. See Foods and Nutrition 5, 5a. (3F, W or S)

Psychology, Elementary. See Psychology 53. (5F, W or S)

Public Health, Elementary. See Public Health 50. (3F or S)

Sociology. See Sociology 60. (3F, W or S)

N-20. Personal Hygiene. Orientation course to inform the student on matters of personal health and hygiene. Designed to help the individual meet personal and social responsibilities in the field of health. (1) **Staff**

N-30. Professional Adjustments. Planned to help the beginning students in becoming oriented to the concepts of the nursing profession. (1) **D. Loken**

N-50. Nursing Arts. Orientation to nurse-patient relationship and procedures of nursing care, including supervised practice periods in the wards. (5) **M. Houy**

N-51. Advanced Nursing Arts. Nursing procedures in medical and surgical nursing; includes supervised practice periods in the wards. (5) **M. Houy**

N-53. Medical Nursing. Basic facts concerning the underlying pathology, therapeutic objectives and details of nursing care procedures as they pertain to treatment of numerous important diseases and classes of diseases. (4) **J. Clare Hayward**

N-55. Surgical Nursing. Provides a broad basis of knowledge for the nursing of common surgical conditions and practical application of the principles and practice of nursing in relation to such conditions. (4) **W. E. Cragun**

N-58. Emergency Nursing Principles. Application of nursing principles to emergency situations in home and community. Lectures and demonstrations given. (1) **Edward Budge**

N-59. Pharmacology. Computation of dosage. (1) **M. Houy**

N-60. Advanced Materia Medica and Therapeutics. Physiological, toxicological, and therapeutic action of drugs and the nurse's responsibility regarding drug therapy. (3) **A. Aldous**

N-64. Diet Therapy. Importance of diet as a means of maintaining and restoring health. (2) **L. J. Sessions**

N-66. Diet Therapy Practice. Supervised application of principles of diet therapy, including planning of diets, interviews with patients who have dietary problems, and experience in the preparation of special diets. (3) **L. J. Sessions**

N-101. Gynecology. The science of diseases peculiar to women, including preventive aspects as well as the abnormal conditions; common gynecologic symptoms; diagnosis and treatment by the physician with its relationship to nursing care, social and economic significance of gynecologic conditions. (1) **W. H. Hayward**

N-102. Orthopedics and Orthopedic Nursing. To familiarize the student with orthopedic conditions which will be met in the community and to acquaint her with methods of prevention and treatment used in orthopedic conditions. (1½) **S. M. Budge**

N-103. Dermatology. Designed to give a general knowledge of the more important conditions of the skin and other closely related tissue; their prevention and therapy and an appreciation of their relation to the social and economic problems of the individual. (½) **Omar S. Budge**

N-104 A, B, C. Tuberculosis Nursing. Affiliation with the State Tuberculosis Sanatorium. See University of Utah Catalog. (3½)

N-105. Diseases and Nursing Care in Ear, Nose and Throat. Common disease conditions of the ear, nose and throat with emphasis on preventive methods and on providing skillful care for these conditions. (½) **K. C. Riter**

N-106. Ophthalmology. To help the student become familiar with the common disease conditions of the eye and with methods of prevention and treatment in these conditions. (1/2) **R. O. Porter**

N-107. Urology. Anatomy and physiology reviewed with emphasis upon causes of disease conditions, common manifestations, and social and economic problems associated with these conditions. (1/2) **O. W. Budge**

N-109. Operating Room Principles. Principles underlying surgical asepsis and technique used in the operating room. (1/2) **Zina Reynolds**

N-110. Operating Room Practice. Application of surgical asepsis and operating room techniques. (6) **Zina Reynolds**

N-118. Obstetric Nursing. Basic principles involved in giving good nursing care and instruction to obstetric patients in hospitals and at home. (2) **G. W. Gasser**

N-119. Obstetric Nursing Practice. Application of principles learned in obstetric nursing. (2) **A. Funk**

N-120. Nursing of the Newborn. To help the student understand the preventive and curative factors which are involved in the complete care of the newborn child, and aid the student in acquiring the skills needed in safeguarding the health and welfare of babies through good nursing and through teaching the mothers. (1) **G. Knight**

N-121. Psychiatry and Psychiatric Nursing. Affiliation with University of Colorado. (4)

N-122. Pediatrics and Pediatric Nursing. Affiliation with Denver General Hospital, Denver, Colorado. (4)

N-123. Pediatric Medical and Surgical Nursing Practice. Affiliation with Children's Hospital, Denver, Colorado. (6)

N-125. Communicable Diseases and Communicable Disease Nursing. To give the student an understanding of the communicable diseases and the particular aspects involved in nursing care for these conditions. (1) **R. N. Barlow**

N-129. History of Nursing. The history of nursing from earliest times to the present with emphasis on modern developments. (2) **M. Houy**

N-130. Professional Adjustments II. Problems associated with the practice of nursing as well as opportunities for continued personal and professional development. A brief study of various nursing fields open to young graduates. (2) **D. Loken**

N-140. Nursing Trends. Nursing in Modern Society. An over-all view of nursing in the present society and economic situation to help the student appreciate her social and professional responsibilities. (1) **D. Loken**

SCHOOL OF COMMERCE

General Information	140
Pre-Legal Training	140
Training for Government Service	140
Agricultural Economics and Marketing	141
Business Administration	143
Accounting	144
Business Administration	145
Business and Distributive Education	147
Merchandising	148
Economics	148
Political Science	151
Secretarial Science	153
Sociology	156
Social Work	159

General Information

THE purpose of the School of Commerce is to give opportunity for a liberal education with special emphasis upon the commercial, social and political phases of life. Persons who complete the courses offered in this School are prepared to assume leadership and responsibility in business and in various industries and professions. In order to meet the growing demand and to keep pace with recent tendencies in education, students may major in Accounting, Business Administration, Merchandising, Secretarial Science, Business Education, Economics, Political Science, Sociology, Agricultural Economics and Marketing.

For the professions of law and medicine some of these subjects such as Economics or Political Science afford excellent preparation. Graduates who have met the necessary requirements are prepared for positions as teachers in high school. Many desirable positions as industrial managers are open to those who are qualified by training and experience. Many students who are especially qualified find employment in the field of retail and wholesale merchandising.

Special attention is called to the many opportunities for service in sociological and governmental work. (See Training for Government Service.) The Departments of Political Science and Sociology offer basic and professional courses in these fields.

For requirements for admission, certification, and graduation see pages 43 to 51.

NOTE: All students in the School of Commerce are urged to take Textiles and Clothing 15 and Principles of Nutrition 5, School of Home Economics.

Pre-Legal Training

Students who plan to go into the profession of Law may pursue a course of study, primarily in the School of Commerce, that will not only enable them to meet all entrance requirements in any American law school, but will also form an excellent foundation for the study of law.

Some law schools admit only college graduates. Others admit students on the basis of three years of college training. College graduation is desirable even where it is not required for admission.

Prospective law students may major in any department in the School of Commerce, but not less than fifteen credits of work should be done in each of the following fields: Accounting, Economics, Political Science, Sociology, History and English, in addition to meeting the requirements for graduation in the Major Department.

All pre-legal students should consult Professor M. R. Merrill.

Training for Government Service

The Federal Government during recent years has employed increasing numbers of College-trained men and women who are qualified for service in its various departments. In all probability this expansion of government activity will continue for several years. In suggesting the following courses the School of Commerce has attempted to indicate lines of study which will be helpful in preparing for government service. With slight modification, these courses will serve equally well to qualify the student for desirable positions outside the field of government service, as the basic requirements in both fields are similar.

Suggested Courses

- I. **Accounting:** Acc. 1, 2, 29, 101, 102, 103, 105, 111, 120, 121, 127; Pol. Sci. 129.
- II. **Land Economics:** Econ. 28, Econ. 51, 52 or Ag. Econ. 53a, b; Agron. 56; Pol. Sc. 1, 10 and 129; Bus. Ad. 141; Agr. Engineering 108; Geology 3.

In addition the student should satisfy the requirements for a major in Agricultural Economics.

- III. Marketing:** Econ. 28, 51, 52 or Agri. Econ. 53a, b; Math. 30, 60, 111.
- IV. Consular and Diplomatic Service:** Pol. Sci. 10, 11, 12, 13, 101, 102, 104, 105, 106, 107, 129; German, French, Portuguese, or Spanish depending upon the location desired; English 10 or 11, 111; Econ. 51, 52, 140.
- V. General Administrative Training:**
It is felt that anyone contemplating government service should have an intimate knowledge of the workings of our government and its relationship to industry. To supply that need the following courses are suggested: Pol. Science, 10a, 103, 129, 200; Econ. 125, 147.
- VI. Statistics:** Math. 30, 35, 60 and 111; Econ. 28, 51, 52, 131, 132.
- VII. Secretarial Science:** Sec. Sci. 30, 65, 80, 82, 89, 90, 91, 94, 98, 175, 183, 184, 186, 187; Bus. Ad. 1, 2, 25, 101, 135, 136; Econ. 51, 52, 140; Pol. Sci. 10, 129; Sociology 70.
- VIII. Sociology:**
For Case Work:
Psych. 103a and 103b, 110.
Child Development 60.
Soc. 10, 52, 70, 110, 156, 160, 170, 172, 220.
Soc. 52, 70, 102, 156, 160, 170, 172, 220.
For Social Research:
Math. 34, 35 and 111
Soc. 70, 202, 220.
Thirty credits of factual courses in the Department.
Field Work under supervision.
- IX. Economics:** Math. 30, 34, 60, 111; Econ. 27, 28, 51, 131; Soc. 70. And the courses listed for those majoring in Economics.
- X. Agricultural Economics:**
The student should satisfy the requirement for a major in this department.
In addition a thorough preparation should be made in the special fields in which it is desired to work such as wool, dairying, etc.

Agricultural Economics and Marketing

Administered jointly by the School of Agriculture
and the School of Commerce

W. P. Thomas, G. T. Blanch, D. A. Broadbent, V. L. Israelson, Professors; R. H. Anderson, E. M. Morrison, Associate Professors; E. W. Lamborn, M. H. Taylor, Ramon Wilson, Assistant Professors; H. R. Hochmuth, L. A. Reuss, Collaborators in Research

Students majoring in the Department of Agricultural Economics and Marketing may be graduated from either the School of Agriculture or the School of Commerce. The choice of school should be determined by the field in which the student intends to do his minor work.

Those graduating from the School of Agriculture must satisfy requirements for graduation from that School in addition to other courses prescribed by the major professor. Those graduating from the School of Commerce must, in addition to satisfying the requirements for graduation from that school, include certain basic agricultural courses prescribed by the major professor.

To meet the requirements of students who plan to do graduate work or to enter into a field of employment where technical training is required, a special course has been provided for such students majoring in agricultural economics. Students satisfying requirements as prescribed for this course may graduate from either the School of Agriculture or Commerce. A schedule of this prescribed course may be obtained from the office of the Department of Agricultural Economics.

A Master of Science Degree—The Department offers opportunity for research and graduate study leading to a Master of Science Degree. The research facilities of the Department for training of graduate students are greatly augmented by the investigations conducted in agricultural economics by the Department

staff with the assistance of graduate students. The following courses may be used for graduate credit by students majoring in the Department: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120, 121, 122. For graduate students in other departments the following courses may be used for graduate credit: 102, 104, 105, 106, 112, 113, 114, 115, 116, 120.

A minimum of three credits in the principles of economics is a prerequisite for all courses in agricultural economics.

SUGGESTED COURSE OF STUDY FOR STUDENTS MAJORING IN AGRICULTURAL ECONOMICS IN SCHOOL OF COMMERCE

FRESHMEN

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
Accounting 1	5	Accounting 2	5	Math. 35	5
Speech 1	5	Math 34	3	English 40	5
Zoology 1 or		English 5	3	M. S. 3	1
Botany 1	5	Bact. 1	4	Physiology 4	5
Soc. Sci. 87	1	M. S. 2	1		—
M. S. 1	1		—		16
	17		16		

SOPHOMORE

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
Chem. 10 or		Chem. 11 or		Chem. 12 or	
Phys. Sci. 31	5	Phys. Sci. 32	5	Math. 46	5
English 10	5	Economics 52	5	Pol. Sci. 1	5
Agric. Econ. 53	3	Journalism 12	3	Pol. Sci. or	
Animal Husb. 1	3	Agronomy 1	3	Sociology	5
M. S. 4	1	M. S. 5	1	M. S. 6	1
	17		17	Elective	2
					18

JUNIOR

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
B. A. 25	5	Agric. Econ. 62	5	Ag. Econ. 162	3
Economics 165	3	Economics 107	3	Economics 108	3
Accounting 101	4	Accounting 102	4	Agric. Econ. 120	3
Agric. Econ. 121	3	Ag. Econ. 122	3	English 110	4
Economics 135	3	Agric. Econ. 102	3	B. A. 156	5
	18		18		18

SENIOR

Fall		Winter		Spring	
Course	Hrs.	Course	Hrs.	Course	Hrs.
Agric. Econ. 230	1	Agric. Econ. 231	1	Agric. Econ. 232	1
Agric. Econ. 240	2	Agric. Econ. 105	3	Agric. Econ. 242	2
Agric. Econ. 104	3	Agric. Econ. 115	3	Agric. Econ. 163	3
Agric. Econ. 114		Plant Science	3	Agric. Econ. 112	3
or 116	3	Animal Science	3	Agric. Econ. 113	2
B. A. 151	3	Elective	4	Agric. Econ. 106	5
Elective	5		—	Elective	1
	17		17		17

See Agricultural Economics in School of Agriculture for course listings.

Business Administration

V. D. Gardner, L. Mark Neuberger, Professors; Ina Doty, Clara P. West, Norman S. Cannon, Charles G. Ellington, Leo M. Loll, Assistant Professors; Guy Murray, Special Lecturer.

W. L. Wanlass, Parley E. Peterson, Professors Emeritus.

Students majoring in Business Administration and Accounting may concentrate in the fields of Accounting, Management, Merchandising, Secretarial Science and Business Education. Students are advised to select from the courses listed below to complete their major and technical subjects according to their field of concentration. (Students majoring in Secretarial Science should register under the advice of the Instructional Staff for Secretarial Science.)

CREDIT TOWARD MASTER OF SCIENCE DEGREE

With the approval of heads of related departments in which students are candidates for the Master of Science degree, Courses No. 101 or above in the Department of Business Administration and Secretarial Science are acceptable for graduate credit.

RECOMMENDED COURSES FOR MAJOR AND SPECIAL GROUPS IN BUSINESS ADMINISTRATION

Freshman Year

Dpt.	No.	TITLE OF COURSE	Accounting	Bus. Adm.	Merchandising
B.A.	1-2	Int. Accounting	10*	10*	10*
B.A.	63	Salesmanship	—	4	4
Econ.	51	General Economics	5*	5*	5*
Econ.	27	Economic Dev. of U. S.	3	3	3
Econ.	28	Economic Geography of World	3	3	3
Psy.	53	Psychology	5	5*	5*
B.A.	20	Problems of Small Business	—	5*	5*
Soc.	70	Principles of Sociology	—	5*	—

Senior Year

Dpt.	No.	TITLE OF COURSE	Accounting	Bus. Adm.	Merchandising
B.A.	12	Soc. Security & Payroll Accountg.	3*	—	—
B.A.	25	Int. Business Administration	5*	5*	5*
B.A.	59	Blue Print Reading and Ind. Draw.	3*	3*	3*
B.A.	62	Marketing	5*	5*	5*
B.A.	28	Business Finance	5*	5*	5*
Econ.	52	Advanced General Economics	5*	5*	5*
Math.	34	Algebra	3*	3*	3*
Math.	30	Math. 30 for Bus. & Acct. Students	3*	3*	3*
Math.	60	Math. of Investment	3*	3*	3*
P.S.	11-12-13	Commercial Law	9*	9	9
S.S.	65	Indexing and Filing	3*	3*	—

*Urgently recommended.

Junior Year

Dept.	No.	TITLE OF COURSE	Accounting	Bus. Adm.	Merchandising
B.A.	101-2-3	Advanced Accounting Principles	9*	9*	9*
Econ.	125-6-7	Labor Problems	—	9*	—
B.A.	129	Governmental Accounting	3*	—	3
B.A.	140	Insurance	3	3	3
Soc.	140	Social Psychology	—	3*	—
B.A.	141-142	Real Estate	—	6*	6
B.A.	151-2-3	Pro. in Merchandising	—	9*	9*
B.A.	155	Personnel Administration	—	3*	3*
Psy.	155	Psychology of Business	—	3*	3*
B.A.	156	Principles and Probl. of Advt.	—	5	5*
B.A.	161-2-3	Problems in Retail Distribution	—	9	9
Econ.	145	Economics of Consumption	—	2	2
Econ.	165	Money and Credit	3*	3*	3*
P.S.	104-5-6	Commercial Law	9*	9*	9*

Sophomore Year

Dept.	No.	TITLE OF COURSE	Accounting	Bus. Adm.	Merchandising
B.A.	111	Cost Accounting	5	5	—
B.A.	107	CPA Problems	9*	—	—
B.A.	104	Accounting Systems	5*	5	5
B.A.	120-21-22	Auditing Principles	9*	—	—
B.A.	126	Accounting Seminar	2*	—	—
B.A.	127-128	Income Tax Accounting	6*	—	—
B.A.	130	Investments	5	5	—
Econ.	131-2	Business Statistics	6*	6*	6*
B.A.	133	Industrial Management	5	5*	5*
B.A.	149	Business Policy	5	5*	5*
B.A.	154	Industrial Purchasing	—	4*	4*
B.A.	160	Sales Management	—	5*	5*
B.A.	164	Credit Administration	4*	4*	4*
Sec.Sc.	175	Office Management	3*	3*	3
Econ.	107-8	Advanced Economics	6*	6*	6*
Econ.	171	Economics of Business Cycles	3*	3*	3*
P.S.	107-8	Commercial Law	6*	6*	6*

Notes: Inasmuch as some of the above courses are taught only every other year, the student is not required to take the courses in the year indicated. However, the general outline should be followed whenever possible.

Special Offerings for Returning Veterans Who Are Not Candidates for Degrees

For capable, mature persons whose education has been interrupted by the war and who want maximum professional training in a minimum of time, two two-year courses in addition to the one in Secretarial Science have been organized in the School of Commerce. These courses minimize liberal course offerings and concentrate upon vocational and professional courses. One gives training in merchandising and the other in accounting. Only those students who know definitely that they will not seek a degree should pursue these courses and then only after consultations with the head of the department. A special course in problems of small business is included.

ACCOUNTING

1. 2. Introductory Accounting. Presents basic principles of accounting in the form of lectures, questions, problems and practice sets which require application of the theory advanced. Principles and techniques learned here will be useful as a basis for further study of accounting and as an aid in the understanding of the more common problems of business. Technique will be emphasized. (B.A.1:5F or W) (B.A.2:5 or S)

Cannon

*Urgently recommended.

Burrough's Calculator. (See Secretarial Science 94.)

Commerical and Bank Posting. (See Secretarial Science 98.)

Mathematics for Business and Accounting Students. (See Math. 30.)

12. Social Security and Payroll Accounting. Offered in response to a need for more explicit information regarding laws affecting labor and accounting practice incident to observation thereof, in connection with such matters as Federal Old Age and Retirement Benefits, Workman's Compensation, Fair Labor Standards Act, Withholding Taxes, etc. (3S) **Cannon**

Mathematics of Investment. (See Math. 60.)

101, 102, 103. Advanced Accounting Principles. A basic course in the fundamental technique and principles of accounting. To give a working knowledge of accounting as it serves the business executive is the primary aim of this course. It should prove valuable to students who aspire to a career in accounting, and also to teachers, lawyers, engineers and farmers. Interpretation and use of accounting as a tool of management is emphasized. Since facility in analysis can be acquired only through abundant practice & problems and home assignments are provided. Graduate credit may be allowed upon the completion of some additional work. (4F, W, S) **Gardner**

104. Accounting Systems. Accounting and personnel problems involved in the development and installation of systems of accounting. Among topics covered in the first half of course are objectives of the accounting system; planning the system to provide the information needed by management; chart of accounts; accounting records; and business papers and office routine. The second half of the course is devoted to problem work in designing systems for specific businesses. (3F) (Not given 1950-51) **Cannon**

107. CPA Problems. Selected problems from professional examinations of various states. (3S) (Not given 1950-51) **Cannon**

109. Accounting for Non-Commercial Students. For students in Engineering, Agriculture, Home Economics, Forestry, and other non-commercial students. (3F, W or S) **Gardner**

110. Accounting for Non-Commercial Students. Laboratory optional for those taking Accounting 109. Recommended if possible. (1F, W or S) **Gardner**

111. Industrial Cost Accounting. Job costing, process cost accounting, standard costs, estimating cost systems, distribution costs, special considerations. (5W) **Gardner**

120, 121, 122. Auditing Theory and Practice. Auditing principles and procedures, presented to give a practical knowledge of auditing. Prerequisites: A good working knowledge of accounting principles and techniques. (3F, W, S) **Cannon**

126. Accounting Seminar. (2S) **Cannon**

127, 128. Income Tax Accounting. Current Federal and State Income Tax Laws. Practical problems in the preparation of Income tax returns. (3F, W) **Cannon**

129. Governmental Accounting. Basic principles underlying the treatment of public and governmental accounts. Typical topics for study are: statutory funds, budgets, trust funds, and preparation of financial reports. (3S) **Cannon**

BUSINESS ADMINISTRATION

Business Communications. (See Secretarial Science 30.)

20. Problems of Small Business. A survey of problems encountered in starting a small business. Consideration is given problems encountered before operations are started, such as selecting the right type of business, form of business, permits, license, choosing a location, credit and financing. In addition, the problems and details of actual operating procedures such as accounting controls, insurance, taxes, buying and selling are considered in relation to various types of small business operation. Designed to aid the man just entering business. (5F or S) **Ellington**

25. Introductory Business Administration. Fundamentals of business administration. Provides a background for the study of the more complex problems of business. Not open to freshmen. Lectures and reports (5W) **Neuberger**

28. Business Finance. The structure of the corporate enterprise; providing for a new company; expansion of existing companies; recapitalization and reorganization of the corporation. Financial and operating ratios are discussed. Proper financial plans and methods of marketing securities are also considered. Open to qualified sophomores. Practical problems are emphasized. Prerequisites: Econ. 51, 52 or equivalent, B.A. 1, 2. (5S) **Gardner**

30M. Business Mathematics. For students in B.A. (3F or W) **West**

Commercial Art and Posters. (See Art 31.)

Color. (See Art 32.)

Psychology of Business and Industry. (See Psychology 55 and 155.)

B.A. 59. Blueprint Reading and Industrial Drawing. (See Civil Engineering 59. Required of all sophomore majors in Business Administration.)

Mathematics of Investment. (See Math. 60.) Urged for all accounting majors.

Indexing and Filing. (See Sec. Sc. 65.)

Labor Problems. (See Economics 125, 126, 127.) Required of all business administration majors.

Business Statistics. (See Economics 131, 132.) Required of all business administration majors. (3F, W) **Connor**

133. Industrial Management Problems. Selected cases are taken up for study and report. Problems in industrial location; choice of site; buildings and layouts; selection, purchase, and arrangement of equipment; purchasing of stores; organization; industrial research; labor relations and problems in managerial control. Prerequisite: B.A. 25 or B.A. 20. (5F) **Gardner**

139. Investment Principles. Deals with basic principles of investment including characteristics of bonds and stocks; operation of securities markets; sources of information; interpreting financial news; mathematics of investment. Part 2 deals with analysis of different types of securities. See Economics 139. (3F) **Loll**

140. Insurance. Studied primarily from the standpoint of the consumer of insurance services. Among the topics treated are: types of life and property insurance contracts, nature and uses of life and property insurance, life insurance as an investment, and the organization, management and government supervision over insurance companies. Attention also given findings of the Temporary National Economic Committee in its study of the life insurance business. (3F) **Ellington**

Social Psychology. (See Sociology 140 and Psychology 161.) Recommended for all business administration majors.

141. Real Estate. For those who will be considering the purchase of real estate and of securities based upon real estate, and as an introduction to the general field of real estate contracts, forms, and principles. Recent Federal housing legislation is analyzed. (3W) **G. Murray**

142. Real Estate From Buyer's Point of View. Practical guidance in the scores of factors which go into wise property and home buying. Problems of location, financing, cost in relation to personal income and other details are discussed. This course arms the prospective owner with essential information by which he can save both money and long range worry in buying his home or business property. Offered as a special service to students in Home Economics. (3S) **G. Murray**

147, 148. Administration of Small Business. An intensive course for students in Engineering, Technology, and Agriculture. Attention given factors that determine whether a business should be started, the form of the business and such operating problems as accounting and statistical control, financial control and problems of marketing. (3W, 3S) **Loll**

149. Business Policy. A co-ordinating course aimed to develop perspective and judgment and facility in solving business problems. Problems are discussed in production, distribution, personnel, finance, control, legal and ethical aspects of business. Required of all majors in Business Administration. (5S) **Gardner**

155. Personnel Administration. A critical analysis of the problems of labor management which confront the manager of a business enterprise and of policies and methods of dealing effectively with these problems. Lectures, problems and selected cases. (3S) **Neuberger**

Money, Credit and Prices. (See Econ. 165.) Strongly recommended for business administration majors.

Office Management. (See Sec. Sci. 175.) Required of all business administration majors. **Neuberger**

Economics of Business Cycles. (See Econ. 171.) Required of all business administration majors.

190. Seminar in Business Education. (See Sec. Sci. 190.)

191. Business Administration Seminar. Special reports and group discussion on current developments in business will be made. Open only to qualified juniors and seniors. (2S) **Staff**

BUSINESS AND DISTRIBUTIVE EDUCATION

The School of Commerce and the School of Education cooperate in meeting the demand for well-trained teachers of business subjects. In the selection of their courses in Business Administration, Secretarial Science, and Education, students should advise with Professor Neuberger.

179. Methods of Teaching Typewriting and Bookkeeping. (3W)

180. The Teaching of Shorthand. (3) Not given 1950-51)

189. Practicum in Business Education. (1-2F, W or S)

190. Seminar in Business Education. (2S)

191. Problems in Teaching Business Subjects. (3Su)

194. Principles and Objectives of Distributive Education. (3Su)

195. Part-time Distributive Education. (3Su)

200. Research in Business Education. Credit arranged. (F, W or S)

Students who wish to qualify for a teaching certificate in **General Business** or **Distributive Education** should take the following courses. Those who wish to qualify for a certificate with a major in **Secretarial Science** should refer to the curriculum outlined in that department.

Dept.	No.	TITLE OF COURSE	General Business	Distributive Education
B.A.	1-2	Introductory Accounting	10	10
P.S.	11-12-13	Commercial Law	9	9
B.A.	20-25	Int. Business or Small Business	5	5
B.A.	28	Business Finance	5	
B.A.	30M	Business Mathematics	3	
Econ.	51-52	General Economics	10	10
B.A.	55	Personnel Administration		3
B.A.	62	Principles of Marketing	5	5
B.A.	63	Salesmanship		4
S. Sc.	65	Indexing and Filing	3	3
Econ.	107-108	Intermediate Economic Theory	6	6
Econ.	107-132	Business Statistics	6	6
B.A.	133	Industrial Mgt. Problems	5	
B.A.	149	Business Policy	5	
B.A.	151-2-3	Problems in Merchandising	9*	
B.A.	156	Principles of Advertising		5
B.A.	161-2-3	Problems in Retail Distribution	9*	9
Psy.	102	Educational Psychology	5	5
Ed.	113	Vocational Guidance	3	3
Bac.	155	Health Education	3	3
Ed.	144	Organization and Administration	3	3
Ed.	116 or 141	Articulation of Ed. or Social Ed	3	3
Ed.	111	Principles of Education	3	
B.A.	194	Principles & Objectives of Distributive Ed.....		3
Ed.	127	Secondary School Methods	2	2
Ed.	129-130	Student Teaching in the Secondary School.....	8	8
Psy.	155	Business Psychology		3
S. Sc.	179	Meth. of Teaching Typewriting & Bookkeeping	3	
B.A.	195	Part-time Distributive Education		3

*Students following the General Business Curriculum may take B. A. 151-2-3 or 161-2-3.

MERCHANDISING

62. Principles of Marketing. (See Ag. Econ. 52.) Required of all majors in business administration and merchandising.

63. Salesmanship. The history, development and opportunities in sales work are covered. The necessity and methods of securing proper preparation for sales work in order to meet the problems encountered in both direct selling and retail selling are analyzed. The principles of preparing for interviews, proper presentation, gaining favorable attention, arousing the desire to buy, meeting objections, and creating acceptance are studied. For those who desire, special projects can be carried out in relation to a particular field or type of selling. Lectures and assigned cases. (4F or W) Ellington

151, 152, 153. Problems in Merchandising. The aim is to present by means of carefully selected cases the manager's merchandising problems. Methods of marketing merchandise; selection of channels of distribution for consumer and industrial goods; sales organization and control, advertising and sales promotion; stock-turn, price policies. (3F, W, S) Ellington

154. Purchasing. Involves a study of the significance of purchasing as a major activity in modern business. Consideration given organization, policies and control of the procurement function. Lectures and problems. (3W) Ellington

156. Principles of Advertising. Intended for those who as business executives will direct publicity programs: Includes study of the structure of advertisements, appeals used in the preparation of advertisements for different products, choice of media, consumer research and the work of advertising departments and agencies. Actual cases are studied and analyzed to lead the student to judge the possibilities of advertising as a sales tool for various products and firms. Selected reading and cases. (5S) Ellington

160. Sales Management. Aims to give a broad view of the important phases of sales administration, planning and execution as applied to manufacturing and wholesale concerns. It deals specifically with the structure and functioning of the sales organization and the correlation of its activities with those of the production and other departments of the business enterprise. Specific attention is given such topics as: marketing policies, sales planning, sales branches, selection and training of sales force, control of sales operation, sales budget, volume margins and profits. (5W) (Not given in 1950-51) Ellington

161, 162, 163. Problems in Retail Distribution. For students who wish to gain an understanding of the marketing field from the viewpoint of the retail distributor. The problems given major attention are: types of retail institutions, accounting and statistics, location, store layout, merchandise classification, service policies, pricing, brand policies, buying, merchandise control, advertising and sales promotion, general organization and administration policies. Selected reading and cases. (3F, W, S) (Not given 1950-51) Ellington

164. Credit Administration. Nature and functions of credit; forms of credit instruments; sources of credit information, organization and management of credit operating functions; technical and legal aspects of collections; credit and collection control. (3W) Ellington

Economics

Evan B. Murray, Professor; Leonard J. Arrington, Norman S. Cannon, Leo M. Loll, Jr., Assistant Professors.

W. L. Wanlass, Professor Emeritus.

Students majoring in this Department should include the following Upper Division courses in either the major or related work. Economics 106, 107, 108, 125, 131, 140, 147, 155, 165, 171, 174, 211; Agricultural Economics 113a; Business Administration 101, 102; Political Science 105, 106, 107, 108, 116.

The Economics Department offers a program of study leading to the Master

MASTER OF SCIENCE DEGREE IN ECONOMICS

of Science degree. The following courses may be taken in preparation for this degree: Economics 107a, 107b, 125, 131, 132, 155, 165, 171, 174, 200, 205, 206, 207, 209, 211.

The following may be taken for graduate credit by students in other departments: 107a 107b, 125, 135, 165, 171, 174, 200, 205, 206, 207, 209, 211.

26. Economic Development of Europe. The Classical and Medieval heritage of Modern Europe. The Commercial Revolution and the Industrial Revolution: their history, consequences and interrelationship with political and social development. (3F) **Loll**

27. Economic Development of the United States. The historical development of economic factors. Particular attention is given the rise of the American labor movement, the development of the monetary and banking system, the evolution of commerce and communication, and the course of American industrial development from the small one-man business of early times to the great corporations of today. (3W) **Loll**

28. Economic Geography. The physical environment and climate and their effects on man and civilization. A survey of world resources, commerce and industry. The factors of location and trade. (3S) **Loll**

51. General Economics. For the general college student regardless of field of specialization. Emphasis is on understanding of principles and institutions underlying operations of the economic system. (5F, W or S) **Staff**

52. Economic Problems. A continuation of Economics 51. The problems of labor, finance, economic instability, international economics, social waste, government control, and world economic systems. Required as a prerequisite to all senior college courses in the School of Commerce except in Agr. Econ. (5F, W or S) **Staff**

107, 108. Intermediate Economic Theory. A critical analysis of present-day economic theories of value, distribution, and related subjects. Must be taken by all students majoring in Bus. Adm., Agr. Econ., and Econ. Prerequisites: Econ. 51, 52 or Ag. Econ. 53a, 53b. (3W or S) **Wanlass**

125. Trade-Unionism and Collective Bargaining. Development, structure, function, government, and philosophy of trade unions in United States; making and administering collective agreements; impact upon the system; policy issues. (3F) **Murray**

126. Trade-Unionism and the Law. The legal frame-work of trade union activity; restrictive, permissive, and promotional legislation; the judiciary and labor. (3W) **Murray**

127. Social Security. A survey of the main divisions of social security legislation; workmen's compensation, legal minimum wage, regulation of hours, unemployment compensation, old age insurance, family wage systems, and health insurance. Prerequisites: one course in Economics and one in Political Science. (3S) **Murray**

131, 132. Business Statistics. Application of statistical methods to business problems with attention to graphs, analysis of time series, interpretation of index numbers and the statistics of particular industries and business in general. Prerequisites: Math. 111; Econ. 51 and 52. This course may be used for a major in Bus. Adm. (3F, W) **Cannon**

135. Transportation Economics. Emphasis is placed on railroad transportation in the United States. Some attention given highway and airway transportation. The underlying economic principles receive more attention than the practical phases of transportation. Special attention given those problems peculiar to the intermountain section. Prerequisites: Econ. 51, 52. (3F) **Murray**

139. Economics of Security Markets. Analysis of organization and operation of stock and bond markets; security speculation; brokerage houses; exchange relations with other institutions; security price behavior; exchange regulation. (3F) **Loll**

140. International Economic Relations. Special attention is given basic

economic relationship between industrial nations of the world, international commerce, farms, and trade restrictions, international debt and finance, and various means of promoting progress on a basis of sound economics. Prerequisites: Econ. 51, 52. (3F) **Wanlass**

141. Current Economic Problems. A study, based on current reading material, of how to achieve and maintain full production, full employment, and economic stability in the United States and other national economies. (3F) **Arrington**

143. Economy and Trade of Latin America. The countries of Latin America are taking an increasingly important place in world trade. This trade and the economics are studied. Alternates with Economics 140. (3F) **Wanlass**

145. Economics of Consumption. There is an economics of consumption that is as important as the economics of production. This course deals with personal and group expenditures, standards of living, budgets, variations in consumption, etc. (3W) **Wanlass**

150. Comparative Economic Systems. The more important present forms of economic organization: their history, theory, and practices. Emphasis on Capitalism, British Socialism, German Fascism and Soviet Communism. (3S) **Loll**

155. Principles of Taxation. Taxation in war and peace. Government expenditures. Taxes and a means of raising revenues and as a means of social reform. The American tax system. The general property tax. Our income tax. Death taxes. Taxes upon business. Social insurance taxes. The effects of taxes in the American economy. War and postwar finance. Special attention is given the tax problems of Utah. (3W) (Not offered 1950-51) **Wanlass**

165. Money, Credit and Prices. The structure and operations of money and financial institutions. Special attention given bimetalism, the gold standard, the money market and the relation of money and credit to prices. Prerequisites: Econ. 51, 52. (3F) **Wanlass**

170. Economic Development of the West. The development of agriculture, industry, transportation, and finance in the West. (3) **Arrington**

171. Business Cycles. The economics of cyclical fluctuations. A critical examination is made of the more significant theories offered in explanation of the cycle. A survey of existing and proposed means of control. (3W) **Loll**

174. Corporate Concentration and Public Policy. The history and development of giant corporations; the extent, characteristics, and significance of corporate monopolies and oligopolies; international cartels. Possible public policies: anti-trust activity, cooperatives, government regulation, government operation. (3S) **Wanlass**

175. Public Utility Economics. Public utility operations, regulation and problems. The semi-private, semi-public nature of the utilities render them an especially apt subject for special treatment in a period when the question of government ownership vs. government control is under consideration. Prerequisites: Econ. 51, 52. (3S) **Wanlass**

200. Research in Economics. Special investigations in problems in economics may be carried on by senior and graduate students. Credit granted according to work done. (F, W or S) **Arrington**

205. Graduate Seminar in Monetary and Banking Theory. The relation of monetary and banking theories to the problems posed by current world difficulties is examined in some detail. Open to graduate students and seniors with adequate preparation. (2) **Loll**

206. Graduate Seminar in Fiscal and Tax Problems. Problems of attaining economic stability through use of government fiscal policy. Attention focused upon problems which have resulted from World War II. (2) **Loll**

207. Graduate Seminar on Monopoly and Combination. Our economic society has been characterized by freedom of enterprise and competition, but numerous public and private attempts have been made to control the production and marketing of agricultural and industrial commodities. The growth, development, and present status of these control schemes, both domestic and international are traced and appraised. (2) **Arrington**

208. Income and Employment. Analysis of factors determining the general level of output, income and employment; discussion of public policies designed to maintain full employment and high production. (2) **Arrington**

209. Graduate Seminar. Designed to acquaint students with methods of research in economics. A survey of the literature of economic research and practice in the carrying forward of research projects. Prerequisite; permission of instructor. (2) **Murray**

211. Graduate Seminar. Same as Economics 209, except that emphasis is placed upon a study of bibliographical materials in economics and a study of economic literature. Prerequisite: permission of instructor. (2) **Murray**

212. Graduate Seminar in Industrial Relations. Application of principles and practices of American trade-unionism brought to light through individual and group research projects; analysis and evaluation of current issues in the field of labor. (2) **Murray**

Political Science

M. R. Merrill, Asa Bullen, Professors; Wendell Anderson, Assistant Professor.

F. D. Daines, Professor Emeritus.

See pages ... and ... for courses which may satisfy group requirements.

Students majoring in this department are expected to have their course schedules approved by the head of the department for at least six quarters prior to graduation. Exceptions may be made by the departmental faculty.

1. Government and the Individual. Introduces the student into the political world of American democracy. Study is made of totalitarian governments and the philosophies of fascism and communism which form the theoretical bases of these regimes. Democracy as practiced in the United States and Great Britain is contrasted with these systems. (5F or W) **Merrill**

10. American National Government. Major attention is given to the national government. It is desirable but not required that it be taken before upper division courses in Political Science. (5F, W or S) **Staff**

11, 12, 13. Commercial Law. Course 11 is a general survey course intended for students outside the School of Commerce as well as an introductory course for students who take any additional Commercial Law courses. Courses 12 and 13 are devoted to comprehensive study of the law of contracts and agency. Open to all students of sophomore standing or above. (3F, 3W, 3S) **Bullen**

15. American State and Local Government. The emphasis is on state municipal and county or rural governments. It follows Political Science 10. (5S) **Anderson**

20, 21. Government in the Modern World. A general study of government designed particularly for students majoring in professional fields and particularly for students in the School of Engineering. Other students, however, may register for this course but students who register for Political Science 1 should not register for either 20 or 21. Basic features of the American governmental system are discussed in 20, while other contemporary political systems are discussed in 21. Students may take either or both quarters without prejudice. (3F, 3W) **Merrill**

70. Comparative European Governments. A comparative study of the various forms and kinds of governments that have developed in the modern world with primary attention directed toward Europe. (3S) **Daines**

75. Latin American Governments. The various Latin American governments are discussed. Attention also is given political and economic relations of the United States with the Latin American states. (3W) **Staff**

101. American Foreign Policy. The place of the United States in the family of nations as affected by our traditions, interests, and interpretations of international affairs. (3S) **Merrill**

102. International Political Relations. Psychological, economic, racial, and other obstacles to international cooperation, as exemplified in recent events and

present day world politics including relations with Russia, aid to Western Europe, the North Atlantic Pact, control of atomic energy and other weapons of warfare, and the program of the United Nations are discussed. (3W) **Merrill**

104, 105, 106, 107, 108. Commercial Law. Course 104 is a study of the law of negotiable instruments, while 105 and 106 include the study of the law of bailments, sales and personal property, partnerships, corporations, and bankruptcy. Courses 107 and 108 include the study of the law of real property, including estates, deeds, conveyancing, abstracts of title, mortgages, wills. Courses 105 and 106 alternate with 107 and 108; 107 and 108 will be given in 1950-51. Prerequisites: Political Science 11, 12, 13. (3F, 3W, 3S) **Bullen**

110. Basic Problems in International Relations. Examines current international developments with special emphasis on basic problems of international concern, and an analysis of various philosophies and systems of government that conceivably might arise as a result of vast changes now evident in the world. (3F) **Daines**

111. International Organization. Examines briefly the attempts of the past to achieve some type of international organization. Major emphasis on League of Nations and United Nations, particularly the latter and related organizations such as United Nations Educational Scientific and Cultural Organization, World Health Organization, Food and Agricultural Organization, International Labor Organization, and the World Bank and Monetary Fund. Also a limited examination of regional organizations and various proposals for world government. (3S) **Anderson**

117, 118, 119. American Political Thought. The development of American ideas concerning the State and political authority from colonial times to the present. The nature and purpose, modes of organizing and controlling political action in terms of historical and social origins; and applicability to modern problems. Students may register for one, two or three quarters. (2F 2W 2S) **Daines**

124. Public Opinion and Propaganda. Open to upper division and graduate students, and to lower division students upon recommendation of departmental instructors. Considers politics in its dynamic aspects. The nature of public opinion and the various concepts and techniques of propaganda in domestic and international relations employed by pressure groups, political parties and national states. No prerequisite. (3F) **Staff**

125. Political Parties and Practical Politics. Organization and practices of political parties. (3S) **Staff**

127. Constitutional Law. A foundation course in American Constitutional Law with the case method being used extensively. Prerequisite: Political Science 10. (5F) **Anderson**

128. International Law. A basic course in the law of nations. Students should have had work in international relations or foreign policy. (3W) **Anderson**

129. Public Administration. An introduction to the study of public administration and administrative law for those contemplating public service careers. The role and techniques of management in public enterprise, the organization, legal bases, planning, staffing, personnel, finance and public relations of modern government. (5W) **Anderson**

140. American Legislation. Organization and procedure of legislative bodies. Influences at work in and the character of the output of the national and state legislatures. The laboratory method of approach is used as far as is feasible. Parliamentary law is emphasized. (3W) **Anderson**

145, 146. History of Political Thought. No. 145 covers political theories and ideas from the Greek period to Martin Luther. No. 146 continues the study of political theories from Luther to 18th Century. Students may take either or both quarters. (3F, 3W) **Daines**

150. Recent Political Thought. Political ideas and writers from the close of the 18th Century to the present, with a particular emphasis on analysis of the backgrounds of currently changing political concepts. Examination of contemporary political ideologies. (3S) **Daines**

180, 181, 182. Current Political Problems. A series designed for upper division students. Students may take any quarter without the preceding quarter or quarters, with the consent of the instructor. (2F, 2W, 2S) **Merrill**

201. Research in Political Science. For senior and graduate students. Time and credit arranged. **Staff**

203. Readings and Conferences. For seniors and graduate students. Time and credit arranged. **Staff**

205. Methods in Political Science. The methods the political scientist must use that are common to all sciences, the particular problems with which the social scientist is confronted, and the application of such to the peculiar problems of political science. (3W) **Daines**

207, 208, 209. Seminar in Political Science. A two-credit course each quarter with emphasis on one branch of political science each quarter. Only seniors and graduate students with a major in one of the social sciences may register. (2F, 2W, 2S) **Staff**

211. Thesis. For graduate students working for master's degree. Time and credit arranged. **Staff**

250. Graduate Social Science Seminar. For graduate students in the social sciences. Programs and procedures devised by social science graduate students and department staffs. (1W) Given in 1950-51 as Agricultural Economics, G.S.S.S., 250.

Secretarial Science

V. D. Gardner, Professor; **L. Mark Neuberger**, Associate Professor;
Ina Doty, Clara P. West, Assistant Professors.

Students majoring in Secretarial Science must complete the following courses in addition to the institutional requirements for graduation. Elementary shorthand and elementary typewriting are not required of students who have had the equivalent.

Curriculum in Secretarial Science for B.S. Degree

Dept.	No.	Title of Course	Credit
Sec. Sci.	30	Business Communications	3
Sec. Sci.	65	Indexing and Filing	3
Sec. Sci.	75, 76, 77	Elementary Shorthand	9
Sec. Sci.	80, 81, 82	Intermediate Shorthand	9
Sec. Sci.	69, 70, 71	Transcription Practice	3
Sec. Sci.	86, 87, 88	Elementary Typewriting	3
Sec. Sci.	89, 90, 91	Advanced Business Typewriting	3
Sec. Sci.	94	Burroughs Calculator	2
Sec. Sci.	90	Commercial and Bank Posting	2
Sec. Sci.	67-167	Office Practice	2
Math.	30	Mathematics 30	3
B. A.	1, 2	Introductory Accounting	10
B. A.	25	Introductory Business Administration	5
English	2	Mechanics of Writing	3
English	5	Scientific Vocabulary (or Foreign Language)	3
†Econ.	51	General Economics	5
†Econ.	52	Economic Problems	5
Sec. Sci.	170	Statistical Typewriting	2
Sec. Sci.	175	Office Management	3
Sec. Sci.	183, 184, 185	Advanced Speed Shorthand	9
Sec. Sci.	186, 187	Secretarial Science	6
‡Sec. Sci.	179	Methods of Teaching Typewriting and Bookkeeping	3
‡Sec. Sci.	180	Methods of Teaching Shorthand	3
Sec. Sci.	190	Seminar in Business Education	2
B. A.	100	Accounting	4
B. A.	Elective	Business Administration (Senior College)	3
Econ.	Elective	Economics (Senior College)	3
Electives		Electives (27 of which must be Senior College)	42

Students who wish to qualify for a teaching certificate should add the following courses: Psychology 102, Education 113, Bacteriology 155; Education 114, 116 or 141; Education 111, 127, 129, and 130, Methods in Secretarial Science 179 or 180

A two-year course is also offered in Secretarial Science for students who do not wish to qualify for a B.S. degree but who wish to fit themselves for stenographic positions as quickly as possible.

Two-Year Secretarial Course

First Year

Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Biol. Science	5	Accounting 1	5	Accounting 2	5
Mechanics of Writing	3	Calculator 94	2	Bus. Communications	3
El. Shorthand	3	El. Shorthand	3	Bank Posting 98	2
Typewriting	1	Typewriting	1	El. Shorthand	3
P. E. or M. S.	1	El. Psychology	5	Typewriting	1
Mathematics 30	3	P. E. or M. S.	1	P. E. or M. S.	1
Total	16	Total	17	Total	15

Second Year

Fall		Winter		Spring	
Courses	Cr.	Courses	Cr.	Courses	Cr.
Int. Shorthand	3	Int. Shorthand	3	Sophomore Comp.	5
Transcription Pract.	1	Transcription Pract.	1	Int. Shorthand	3
Adv. Typewriting	1	Adv. Typewriting	1	Transcription Pract.	1
Bus. Administr'n 25	5	Economics 51	5	Adv. Typewriting	1
Indexing and Filing	3	Pol. Science 12	3	Economics 52	5
Pol. Science 11	3	P. E. or M. S.	1	P. E. or M. S.	1
P. E. or M. S.	1	Electives	2	Office Practice	2
Total	17	Total	16	Total	18

30. Business Communications. Fundamental principles of business letter writing. Practice in writing sales, order, collection, adjustment, and application letters. Prerequisite: English 2. (3W or S)

Neuberger and Doty

65. Indexing and Filing. Drill and practice in alphabetic, numeric, triple check automatic, subject, decimal, geographic, and soundex methods of filing. Indexing, coding, and filing of letters, cards, blue-prints, catalogs, and other business forms. (3F, W or S)

Neuberger and Doty

67 or 167. Office Practice. Practical training in use of dictating and transcribing machines, mimeograph, drawing board, switchboard, and other office machines. Required of students majoring in Secretarial Science and those completing the Two-Year Course. (2F, W or S)

Staff

***69. Transcription Practice.** Designed to develop skill and speed in the transcription of letters from shorthand notes. Students must be able to take dictation at not less than 60 words a minute and type at least 40 words a minute. (1F or W)

West and Doty

***70. Transcription Practice.** Continuation of 69. (1W or S)

West and Doty

***71. Transcription Practice.** Continuation of 70. (1W or S)

Doty

75. First-Quarter Shorthand. For students who have had no previous training in shorthand; includes a study of the fundamentals of simplified Gregg shorthand. Emphasis on developing fluency in reading and writing from shorthand plates. (3F or W)

West and Doty

76. Second-Quarter Shorthand. Continuation of course 75. Introduction of the writing of new material. (3F or W)

West and Doty

1—These courses count toward filling the group requirements.

2—Required for a teaching certificate.

*Required of all who register for Intermediate Shorthand 80, 81, 82.

- 77. Third-Quarter Shorthand.** Continuation of course 76. Practice in new-matter dictation. (3F or S) **Doty and West**
- 80. Intermediate Shorthand.** For students who have had previous training in shorthand and who are able to take dictation at not less than 60 words a minute. Includes a review of the theory of simplified Gregg shorthand and the development of new vocabulary and phrase writing. Students must be able to type at least 40 words a minute and must register for Transcription Practice 69. (3F or W) **Doty and West**
- 81. Intermediate Shorthand.** Continuation of 80. Must be accompanied by Transcription Practice 70. (3W or S) **Doty and West**
- 82. Intermediate Shorthand.** Continuation of 81. Must be accompanied by Transcription Practice 71. (3S) **Doty**
- 86. First-Quarter Typewriting.** For students who have had no previous training in typewriting. Designed to develop a thorough knowledge of the keyboard and to give practice in the use of mechanical features of the typewriter. Special attention to the developing of typewriting for personal use. (1F, W or S) **Doty and Neuberger**
- 87. Second-Quarter Typewriting.** Continuation of 86. Attention given sentence and paragraph practice and letter writing. (1W or S) **West and Doty**
- 88. Third-Quarter Typewriting.** Completion of style letters. Training in tabulation, continuity writing, and direct dictation. (1W or S) **Neuberger**
- 89. Advanced Business Typewriting.** For students who have had one year of typewriting. Special attention given advanced letter writing, telegrams, invoices, billing, and tabulation. (1F) **Neuberger**
- 90. Advanced Legal Typewriting.** Preparation of legal forms and manuscripts. (1W) **Neuberger**
- 91. Advanced Secretarial Typewriting.** Work on rough drafts, advanced secretarial problems, and Civil Service Copy. (1S) **Neuberger**
- 94. Burroughs Calculator.** Practice in addition, multiplication, subtraction, and division on Burroughs calculators and the application of the machine to various business computations such as percentages, discounts, prorating, decimal equivalents, and constants. (2F, W or S) **Neuberger and Doty**
- 96. Elliott-Fisher Bookkeeping Machine.** Application of the Elliott-Fisher Machine to business and accounting problems. (1-2F, W or S) **Neuberger and Doty**
- 98. Commercial and Bank Posting.** Practice in the application of the Burroughs posting machine to bookkeeping procedures in commercial and financial institutions and banks. (2F, W or S) **Neuberger and Doty**
- 170. Statistical Typewriting.** For juniors and seniors majoring in business administration, economics, and secretarial science. Practice will be given in setting up charts, tables, and reports. Prerequisite: Sec. 89, 90 and 91 or equivalent work. (2F) **Neuberger**
- 175. Office Management.** Emphasis on principles of office management, duties and responsibilities of the office manager; type of organization; methods of control; office arrangement and equipment; job analysis; selection, employment, and training of employees. Prerequisites: introductory accounting and general economics. (3F) **Neuberger**
- 179. Methods of Teaching, Typewriting and Bookkeeping.** Recent developments and practices in the teaching of typewriting and bookkeeping. Analysis of objectives, laws of learning, organization of material, texts, standards of achievement, and methods of presentation. (3) Not given 1950-51. **Neuberger**
- 180. The Teaching of Shorthand.** Newer methods and trends in the teaching of shorthand, and observation and practice in shorthand classes for those preparing to teach. Consult instructor before registering. (3F) **West**
- 183, 184, 185. Advanced Speed Course in Shorthand.** For students who have had at least two years of shorthand and are able to take dictation at not less than 100 words a minute. Emphasis on increasing shorthand speed through speed phrases and reporting shortcuts. Practice in advanced transcription. (3F, 3W, 3S) **West**
- 186, 187. Secretarial Science.** Designed to acquaint students with office routines and procedures and to give practice in quantity production of tran-

scripts and business papers. Includes training in operation of Ediphone. Attention given office conduct and attitudes, personal qualities of a secretary, and the procuring of a position. Prerequisite: Two years of shorthand and type-writing, general economics, introductory accounting, and business communications. (3W. 3S) **West**

189. Practicum in Business Education. Provides an opportunity for the planning and development of practical or creative projects in Business Education. Experienced teachers and students, who are registered for teacher training work, are encouraged to build projects around actual school situations. (1-2F, W or S) **Neuberger**

190. Seminar in Business Education. A reading and research course for junior and senior students majoring in business administration and secretarial science. Special reports on current business education problems and literature are made. (2S) **Neuberger**

200. Research in Business Education. For senior and graduate students. Time and credit arranged. (F, W or S) **Neuberger**

Sociology

R. Welling Roskelley, Joseph N. Symons, Lawrence S. Bee, Professors;
Carmen Fredrickson, Assistant Professor.

Joseph A. Geddes, Professor Emeritus.

All majors in Sociology are expected to take basic background courses in the biological sciences, the humanities and in each of the social sciences, as well as the more basic courses in each field of emphasis within the department. Such courses as Soc. 10 or 70, 40, 52, 60, 87, 110, 141, and S. W. 165 should be taken by all majors. Two options are open:

1. A major may seek a balanced integration into the entire field of Sociology without emphasis in any portion of it. If this choice is made specialization is deferred to the graduate level.

2. A major may, after or concurrently with taking the basic courses named above, elect one of the five following fields for emphasis.

Rural Sociology

Courses are arranged to give the student special training in rural sociology which will help him function in a professional capacity or as a more effective lay citizen. In the professional field he may shape his course to qualify as a teacher, research worker, extension specialist, or as an employee of a governmental or private agency. As a lay citizen he may contribute much toward the development and promotion of programs making for better living. Required: Soc. 130, 154, 156, 187, S. W. 180. Sustaining: Soc. 70, 160, 170, S. W., 173.

The Family

Offerings in the field of the family are planned to meet three functions; namely, (1) to contribute to the student's general education, (2) to provide a better foundation for marriage and family living, and (3) to offer professional training in the field of the family—teaching, counseling, adult education, etc. It is suggested that students who plan to concentrate their studies in the family area gain as broad and intensive a background in the social and biological sciences and the humanities as possible. Required: Soc. 130, 154, 160, 161. S. W. 174. Sustaining: Soc. 156, 170, S. W. 162.

Crime and Delinquency

Among the social pathologies within the realm of sociology which are of grave concern to society are the problems of crime and delinquency. For those interested in this area an attempt is made to give sound information on amounts, trends, causation, treatment and prevention. For those specializing as school coordinators, probation and parole officers, institutional workers, youth authority employees, etc. Required: Soc. 152, 170, S. W. 162, 182. Sustaining: Soc. 130, 154, 172, S. W. 173, 174.

Community and Social Organization

On the professional level students of community organization serve as teachers, research workers, and extension workers. As lay leaders they coordinate and synthesize collective effort in community building. Required: Soc. 130, 152, 156, 160, 170. Sustaining: Soc. 44, 140, 154.

Social Work

The undergraduate program in social work is organized to prepare students for employment in some of the numerous positions in the field for which full professional training is not required. The program also provides an educational background for students who may later undertake graduate study. Positions in Utah and surrounding states for which the undergraduate program is intended to offer preparation include those of public assistance workers, counselors in children's institutions, and probation officer. Required: S. W. 162, 165, 173, 174, 175, 177, 178, 180, 182, 187, 195, Soc. 110, 170. Sustaining: Soc. 140, 170, Econ. 147, Psy. 105, 183, C. D. 60.

Either Soc. 10 or 70 is prerequisite for all upper division courses in Sociology; also Soc. 40 for 140, 60 for 160, 52 for 152, 87 for 187 and S. W. 187.

MASTER OF SCIENCE DEGREE IN SOCIOLOGY

The Department of Sociology offers work leading to the Master of Science Degree. Research is promoted through departmental relationship with the Agricultural Experiment Station and with federal agencies. Students majoring in Sociology may use the following courses of the 100 series for graduate credit: Sociology 100, 110, 130, 140, 141, 152, 154, 160, 170 and Social Work 173, 165.

The courses above listed may also be used by students in other departments for graduate credit.

THE Ph.D. DEGREE IN SOCIOLOGY

Institutional requirements for the Ph.D. Degree are explained in the section dealing with the Graduate School. This degree is offered in the Department of Sociology through collaboration with closely related departments in the social sciences. Resources are now being expanded in the field of Rural Sociology, in which major emphasis is now being made. A program of building resources for emphasis in general Sociology is also contemplated.

10 Rural Sociology. Attempts to provide a groundwork of information which will lead to enlightened rural citizenship and provide a constructive philosophy for living in the country. Concise digests of programs in 25 or more fields are made. Rural social psychology is given emphasis. Conditions in rural Utah are studied. (5F, W or S)

Geddes and Roskelley

40. Social Psychology I. Personality development among different social classes and peoples. Analysis of crowds, publics, social movements and other collective behavior; ideologies and institutions. Prerequisites: Soc. 70 and Psych. 3. (3W)

Bee

44. Women Today. The progress of women in American society from colonial days to the present. Some attention given women's struggle for status in industry, politics, education, sex, religion, and the arts. Roles and contributions of outstanding women reviewed. (3F or S)

C. Fredrickson

52. The Crime Problem. The broader aspects of crime as a serious contemporary problem. Such topics as the extent, nature, causes of, theories concerning, techniques for coping with, programs for prevention, etc., furnish the course content. (3F or S)

Symons

60. Courtship, Marriage and the Family. Designed to help unmarried and married students understand the roles of social and emotional factors in personality development, courtship, mate selection and marital adjustment. Open to all students. (3F, W or S)

Bee

70. Principles of Sociology. The major propositions inherent in man's influence on other men and his being influenced by other men in association. Culture, groups, personality, crowds, publics, social processes, ecological processes, institutions, etc. receive attention. Soc. 10 or 70 is prerequisite for all Upper Division classes. (5F W or S)

Staff

87. Elementary Social Statistics. Techniques of using statistical method in studying social problems with emphasis upon logical methods of collection, tabulation, graphic portrayal, averages, dispersion, reliability, elementary sampling and simple correlation with brief consideration of the theoretical implications. Majors in Sociology and Social Work should take this course. (3F) **Roskelley**

100. Educational Sociology. The influence of the social processes and social changes on school curricula, objectives and teachers. It includes an appraisal of educational goals in the light of present social needs. (3F) **T.B.A.**

110. Utah Social Problems. Problems dealing with present conditions in fields such as population, migration, housing, insurance, manufacturing temperance, safety, etc., are studied and analyzed. (3S) **Geddes**

130. Introduction to Cultural Anthropology. Treatment of the attitudes, ideas, behavior, basic personality organization, and material results of selected primitive and contemporary cultures. (3F) **Bee**

140. Social Psychology II. Relationship between personality development and ideological patterns among various social classes and cultures. Prerequisite: Soc. 40. (S) **Bee**

141. Rural Community Organization and Leadership. An analysis of the forces and procedures which are at work in developing community organization, with special emphasis on the techniques of training to help make the community more effective. (3F) **Roskelley**

152. Organized Crime. Criminal behavior is becoming more thoroughly organized. As such it has historical backgrounds and a natural history in the U. S. The organization, the fields most organized, and counteracting techniques are the concern of the course. Prerequisites: Soc. 52 and 170, or Instructor's approval. (3S) **Symons**

153. History of Social Thought. The emergence and development of social thought from early periods is traced to August Comte. From this point important developments in Europe and America are studied. Particular emphasis is given to the American field. For majors and minors in Sociology. Others on instructor's approval. (5S) **Symons**

154. Population Problems. Distribution, characteristics, and trends in the population. Special attention given an analysis of Utah population trends. (3S) **Roskelley**

156, 256. Social Institutions. Similarities and differences in the life histories of institutions as they emerge, grow and decline are appraised. Society's efforts to keep institutions attuned to the objectives for which they were organized are observed. (3W) **Geddes**

160. Family Relations. The social-emotional development of the child in the family. Marital adjustment; social-cultural difference in family behavior; problems; ideological considerations. Prerequisite: Soc. 60. (3S) **Bee**

161. Modern Social Problems. An approach to modern social problems based on adjustment to instruments of change as a means of minimizing disorganization. (3W) **Fredrickson**

162, 262. Family Life Workshop. Designed primarily for students preparing to teach family relations. Practical materials are worked out for use in the classroom. Prerequisites: Soc. 60, 160. It is suggested that students take the three courses in sequence. (3S) **Bee**

170. Juvenile Delinquency. The causes of delinquency are considered with the purpose of arriving at intelligent remedies. Various methods of home, social, and institutional treatment are studied; parental cooperation, personal supervision allied with probation and parole, institutional treatment, etc. Prerequisite: Soc. 52. (3W) **Symons**

172. Poverty and Dependency. The extent of poverty, its causes, remedies now in use, and others which give promise. Social methods of caring for dependents are examined. Emphasis on programs which look to prevention and to minimization as well as to adequate care. (3F) **T.B.A.**

180, 181, 182. Current Sociological Problems. For upper division and graduate students. (1F, 1W, 1S) **Staff**

187, 287. Research Methods in Sociology. An advanced course in Methods of Social Research. Prerequisite Soc. 87 or Math. 111. (3F) **Roskelley**

190, 191, 192, 193, 194, 195. Seminar in Sociology. Time arranged. Six quarters required for majors in Sociology. (1F, 1W, 1S) **Staff**

201. Research in Sociology. For advanced students only. A project is organized and field work is carried on under supervision. Original studies are made. Prerequisite: Soc. 70, 87 or Math. 111. (1F, W or S) **Staff**

202. The Study of Society. The basic principles of sociology are considered in their historical, theoretical and scientific settings, as a body of facts, a method of investigation and an explanation of associative living. (5S) **Symons**

207. Graduate Seminar. Short subjects falling within the field of Sociology and pertinent to it but not available in regular courses are selected for study. (2W) **Staff**

210. Advanced Rural Sociology. An analysis of major developments in rural social thought, research and application of both toward the solution of social problems throughout the world. (3S) **Roskelley**

241. Rural Organization. Social organization in areas larger than the local community; district, state, regional, national and international. (2S) **Geddes**

301. Research Methods in Criminology. Careful study and analysis of problems, methods, techniques, and outlook involved in criminological research. (3S) **Symons**

Social Work

Division of Social Work

R. W. Roskelley, Director; **Don C. Carter**, Assistant Director; **Evelyn H. Lewis**, Assistant Professor, Supervisor of Field Work; Contributing—**W. B. Preston**, **Joseph N. Symons**, **Lawrence S. Bee**, **Evan B. Murray**, Professors.

Joseph A. Geddes, Professor Emeritus

SOCIAL WORK CERTIFICATE

The undergraduate student may take a bachelor's degree with a major in Social Work. Courses leading to this degree are offered in the Department of Sociology. For a description of the undergraduate program in Social Work, see page 157.

The Social Work Certificate is conferred on students who have completed 45 credits of graduate professional courses in Social Work during 3 or more quarters of graduate residence.

Professional Social Work courses open to graduate students working for the Social Work Certificate are:

S.W. 200	Principles of Social Case Work I	3
S.W. 201	Principles of Social Case Work II	3
S.W. 202	Principles of Social Case Work III	3
S.W. 210	Field Work I	4
S.W. 211	Field Work II	4
S.W. 212	Field Work III	2-4
S.W. 214	Field Work IV—Group Work	2
S.W. 222	Social Work in Rural Communities	2
S.W. 230	Social Psychiatry I	2
S.W. 231	Social Psychiatry II	2
S.W. 240	Community Organization	3
S.W. 250	Public Welfare Services	3
S.W. 251	Public Welfare Services II	3
S.W. 260	Medical Information	3
S.W. 270	Child Welfare	3
S.W. 275	Principles of Group Work	3
S.W. 276	Contemporary Social Work Literature	2
S.W. 182-282	Children in Institutions	3
S.W. 187-287	Research Methods in Sociology and Social Work	3
S.W. 295-296	Social Work Seminar	1-2

- 147. Social Security.** (For description, see Economics) **Murray**
- 162. Mental Hygiene.** Social and cultural changes that have given rise to problems of adjustment. Reactions to stress; "preventive" growth and adaptation. (3S) **Bee**
- 165. Dynamics of Behavior.** An analysis of behavior causation, with emphasis upon the influence of early experiences upon attitudes and behavior in adolescence and maturity. (3F) **Carter**
- 173. The Field of Social Work.** A survey of contemporary social work as it is divided into the following areas of activity: social case work, social group work, community organization and social action. Study of objectives, processes and personnel requirements of social work agencies. (3F) **Lewis**
- 174. Introduction to Case Work.** Introductory information dealing with theories and practices of social case work. (3W) **Lewis**
- 175. Introduction to Field Work.** To acquaint the students with various agency organizations dealing with social work and related areas. Field trips will be arranged. (3S) **Carter**
- 177. Social Treatment of Children's Problems.** Analysis, investigation and treatment of problems of children. (3F) **Lewis**
- 178. Social Treatment of Adolescence.** Analysis, investigation and treatment of the problems of adolescence and youth. (3W) **Carter**
- 180. Introduction to Group Work.** An introduction to the basic philosophy of social group work, and its application in group leadership. Consideration of the organization and methods of the principal agencies in the community. (2S) **Carter**
- 182-282. Children in Institutions.** Principles underlying the care and treatment of children in institutions. Development and trends in institutional care. (3S) **Carter**
- 187-287. Methods of Social Research.** Technique of defining the problems, developing schedules, interviewing and analyzing sources of material. Majors in Sociology and Social Work should take this course. (3F) **Roskelley**
- 195. Social Work Seminar I.** Required of majors in Social Work. A study of social work publications and other source material applicable to the field. (1W) **Carter**
- 196. Social Work Seminar II.** Required of majors in Social Work. Discussion of laws and administrative practices pertinent to social work. (1S) **Carter**
- 200. Social Case Work I.** Principles and methods of social case work. Investigation, diagnosis and treatment. (3F) **Lewis**
- 201. Social Case Work II.** A continuation of Social Case Work I. Further application of principles and methods especially in relation to social case recording and development of skill in relationship. (3W) **Lewis**
- 202. Social Case Work III.** Case work with children in their own homes or in foster homes as practiced by family and child welfare agencies, schools, etc. Case materials used extensively. (3S) **Lewis**
- 210. Field Work I.** Field work centers will be maintained in selected public and private agencies and supervision will be provided under college direction. S. W. 200 should precede or be taken concurrently. (2-4 F or W) **Lewis**
- 211. Field Work II.** A continuation of Field Work I. (2-4 W or S) **Lewis**
- 212. Field Work III.** A continuation of Field Work II. S.W. 200, 201 are prerequisites. (2-8 S) **Lewis**
- 214. Field Work in Group Work.** A limited amount of leadership training and observation of groups in action is available to students who have completed Social Work 275. (2S) **Staff**
- 222. Social Work in Rural Communities.** Social work in relation to problems of organization, administration and community relations, particularly as they affect rural counties. (2S) **Staff**
- 230. Social Psychiatry I.** Emotional and intellectual factors in adjustment problems; diagnosis of mental and nervous disorders; the interrelation of physical, emotional, mental and environment factors. (2S)

- 231. Social Psychiatry II.** An advanced course open only to students of work who have had S.W. 230. (2W) **Bee**
- 240. Community Organization.** Processes operating in rural and urban communities and development of means for coordinating them. (3W) **Geddes**
- 250. Public Welfare Services I.** The development of the concept of public responsibility and its application in a modern public welfare services program; the historical development of the various public welfare services. (3F) **Carter**
- 251. Public Welfare Services II.** An analysis of the operation of a modern public welfare services program, including: public assistance, social security, public services for children, etc. (3W) **Carter**
- 260. Medical Information.** Diseases most frequently encountered in social work. The interrelations of disease and social conditions. Medical resources. (3W) **Preston**
- 270. Child Welfare.** Evolution and current developments in programs for meeting the needs of children. Consideration is given to substitute parental care and adoptions, to child labor laws, juvenile courts, to problems of the child of unmarried parents, and of the handicapped and the exceptional child. (3F) **Lewis**
- 275. Principles of Social Group Work.** Characteristics of social group work as a method in social work; consideration of the group work process, objectives, and the principles of program development. (2F) **Carter**
- 276. Contemporary Social Work Literature.** Attempts to review current contributions to the various fields of social work literature as well as to acquaint the student with the character of the periodical literature that has been published during the previous year. (2W) **Staff**
- 295-296. Seminar in Social Work.** For advanced students in the Division of Social Work. Current trends in social work are reviewed; particular emphasis upon review of recent literature. (1-2 S) **Staff**

SCHOOL OF EDUCATION

E. A. JACOBSEN, Dean

General Information	163
Art	164
Educational Administration	169
Elementary Education	170
Secondary Education	171
Vocational Education	173
Library Science	174
Music	175
Private Instruction Courses	176
Physical Education and Recreation	177
Psychology	184

General Information

THE School of Education, as an administrative unit of the College, comprises the departments of Art, Education (Administration), Education (Elementary), Education (Secondary), Education (Vocational), Library Science, Music, Physical Education and Recreation, and Psychology. A major function of these departments is the preparation of teachers for elementary and secondary schools. Each department, in addition, offers courses contributing to general education and courses designed to supplement the major work of other departments.

The Bachelor of Science degree with a major in elementary or in secondary education is designed for those who are preparing to teach in elementary or in secondary schools respectively. Students majoring in other departments who wish to prepare for teaching are admitted to teacher training curricula and are counseled in their programs by a committee composed of representatives of the education departments and of the departments in which teaching majors are selected. On the graduate level, provision is made for those who desire to meet requirements for administrative and supervisory credentials and for those who seek general professional advancement.

The School of Education stands firmly on the principle that teachers must not only be liberally educated but be thoroughly prepared in the subjects which they are to teach.

For teachers in junior and senior high schools it is intended that the student shall be prepared to teach in two high school teaching fields. The student's mastery of essential subject matter in the teaching field, rather than the credit hours, should operate in determining subject matter proficiency. Teaching fields should be chosen by the student on basis of his individual abilities and interests and also in the light of available information concerning the demands for beginning teachers and the supply in the respective fields. The curriculum in professional education and psychology aims to impart to prospective teachers the meaning of education in its relation to desirable social objectives, the organization and administration of schools in relation to the needs of the learner and to social aims, an understanding of the nature and needs of the learner and the learning process, and by means of certain technical courses in education, to develop skills in the art of teaching.

The sequence of professional courses in Psychology and Education is such that it is necessary to study in these fields before the final year. A detailed plan of study is not outlined or prescribed. The student who plans to prepare for teaching will usually find it advantageous to devote the first two years to securing a well-balanced general education, giving some attention to courses prerequisite to advanced study. During these years some emphasis may also be placed in the field of specialization. The third and fourth years should be devoted primarily to concentration in the major field of study and to professional subjects in Psychology and Education.

The School of Education holds membership in the American Association of Colleges for Teacher Education.

TEACHER PLACEMENT SERVICE

The College is interested in placing qualified teachers in teaching positions. To accomplish this purpose the teacher placement service has been organized. All students who qualify for teaching certificates are expected and urged to register with the bureau to facilitate the compilation of the proper credentials to be used in placement for the current and future years. Registration should be completed during the winter quarter and early part of the spring quarter.

TEACHER CERTIFICATE

The School of Education is designated by the State Department of Public Instruction as its official representative in administering certification requirements so far as regular students of the College are concerned.

The certification standards conform as nearly as may be to the requirements of the State Board of Education. With the Bachelor's degree the student may qualify for any one of the following certificates:

Teacher's Certificate for Secondary Schools
 Teacher's Certificate for Elementary Schools
 Teacher's Certificate for Kindergarten
 Librarian's Certificate for Elementary Schools
 Librarian's Certificate for Secondary Schools
 Two-year Counselor's Certificate
 Certificate for Secondary School Teachers of Vocational Agriculture
 Two-year Certificate for Secondary School Teachers of Industrial Arts

The Administrative Certificates granted by the State Board of Education may be earned on the graduate level.

Specific requirements for each certificate are listed with the departments in which the major work is offered.

TEACHER TRAINING

The College offers complete programs of teacher training in all phases of public school work. Facilities for practice teaching have been carefully chosen. The Nursery School, operated on the campus by the Department of Child Development in the School of Home Economics, is concerned particularly with the pre-school child. Teachers in Home Economics, Agricultural Education, Industrial Arts, and Technology do their practice teaching under the immediate direction of the departments concerned in selected schools throughout the state and under the general direction of the teacher education committee.

For the training of kindergarten and general elementary teachers the College maintains the Whittier School which includes the kindergarten and grades one to six inclusive. The teachers in the school, selected particularly for their fitness to serve on the teacher education program, are regular members of the College faculty. The training school in addition to its function as a center for teacher education, serves the School of Education as a laboratory in which child growth and development are studied and desirable school practices are developed.

By special arrangement with district boards of education the facilities of their secondary schools are utilized as teacher training centers.

Art

FINE AND APPLIED

Floyd V. Cornaby, Professor and Head of Department; **H. Reuben Reynolds**, Professor; **Jessie Larson**, Associate Professor; **Everett Thorpe**, Assistant Professor; **Warren Wilson**, Instructor.

Calvin Fletcher, Professor Emeritus

The Art Department is prepared to offer major and minor courses of study in the fields of Art Education, Commercial Art, Fashion Design and Illustration, Photography, Painting, Sculpture, Interior Decoration, and Crafts.

As a service unit to the entire college the Art Department is closely correlated with Home Economics, Industrial Arts, Recreation, Landscape Architecture and other major divisions of the college.

The following courses may be repeated for additional credit: Art 104, 106, 108, 109, 110, 111, 112, 113, 114, 117, 118, 135, 171, 271, 272.

Graduate Study. Provision is made through the Art department for work leading to the Master's degree.

Students choosing to major in any of the following fields of art must show aptitude for the work and complete courses listed below:

Art Education

Teaching majors in secondary education are required to complete Art 1, 2, 7, 10, 104, 106, 107, 122, 124, 125, 127, 151, 9 credits in art appreciation, 10 credits in painting and 10 credits in crafts.

Teaching majors in elementary grade supervision or special teaching of drawing, handwork or creative expression are required to complete Art 1, 2, 3, 7, 10, 104, 106, 124, 125, 152, 8 credits in painting and 8 credits in crafts.

Teaching minors in art should take Art 1, 2, 3, 7, 10, 32, 104, 124, 125, 151, 4 credits in painting and 4 credits in crafts.

Clothing and Textile majors desiring a teaching minor in Art should complete Art 104, 111, 127, 135, 151, and 6 credits in crafts.

Elementary Education majors who elect Art as a specialization field should complete Art 1, 2, 3, 7, 10, 104, 124, 125, 4 credits in painting and 4 credits in crafts.

Commercial Art

Students who choose Commercial Art as a major are required to complete Art 1, 2, 3, 7, 10, 32, 35, 104, 107, 108, 110, 117, 124, 135, 140.

Minors in Commercial Art should take Art 1, 2, 3, 7, 10, 32, 35, 104, 110, 124, 135.

Crafts

Majors are required to complete Art 1, 2, 3, 4, 7, 10, 106, 111, 112, 113, 114, 118, 124, 125, 127, Woodwork 61a, 10 credits in 171. Landscape Architecture 20.

Minors are required to complete Art 1, 2, 3, 4, 106, 111, 112, 113, 114, 118.

General Art

Students desiring to major in General Art with no specializations or emphasis on teaching are required to complete Art 1, 2, 3, 4, 7, 10, 32, 104, 106, 124, 125, 126, 127, 132, 133, 10 credits in painting.

Fashion Design and Illustration

Majors are required to complete Art 1, 2, 3, 7, 10, 32, 35, 104, 107, 109, 111, 117, 124, 135, 3 credits in 171, Clothing Textiles and Related Arts 24, 105, 115, 125, 140.

Minors are required to complete Art 1, 2, 3, 7, 10, 32, 35, 111, and Clothing Textiles and Related Arts 24, 105, 115, 125.

Painting

Major requirements are Art 1, 2, 3, 7, 10, 32, 33, 106, 107, 112, 118, 124, 125, 126, 127, 140 18 credits in oil painting and 6 credits in water color.

Minor requirements are Art 1, 2, 3, 7, 32, 33, 106, 107, 124, 125, 126, 127, 10 credits in oil painting, 4 credits in water color.

Interior Decoration

Majors are required to take Art 1, 2, 3, 7, 10, 32, 109, 111, 122, 123, 124, 126, 175. Landscape Architecture 20, Clothing Textiles and Related Arts 24, 33, Household Administration 65, Woodwork 170.

Minors are required to take Art 1, 2, 3, 7, 111, 122, 124, 126, Landscape Architecture 20.

Photography

Students desiring a major in Photography through the Art Department are required to complete Art 1, 2, 7, 10, 32, 108, 109, 117. Photography 61 and 64, 65, 66, 67, or 164, 165, 166, 167. Landscape Architecture 20.

Minors are required to complete Art 2, 32. Photography 61 and two of the following: 64, 65, 66, 67, 164, 165, 166, 167.

Sculpture

Major requirements are Art 1, 2, 3, 7, 10, 33, 106, 107, 112, 118, 124, 125, 126, 127, 12 credits in 171.

Minor requirements are Art 1, 2, 3, 7, 106, 107, 112, 118, 124, 125, 126, 6 credits in 171.

ART COURSE DESCRIPTIONS

Appreciation

3. Art Understanding and Appreciation. Aims to increase enjoyment of living through the sense of sight. Develops understanding of the basic principles underlying architecture, landscape gardening, interior decoration, sculpture, painting, ceramics and other visible forms of art in everyday life. (3F, S) **Reynolds**

26, 126. History and Appreciation of Architecture. The characteristics of the great styles of building and the development of a taste for good architecture. Adapted to the needs of the homemaker, teacher, artist or layman. (3W) **Reynolds**

32, 132. Color. Color as used in stage lighting, painting, design, and everyday life. Its physical, psychological and artistic phases are correlated. Suited to the businessman, layman, dramatists, artists, teacher and painter alike. (3S)

33, 133. History and Appreciation of Painting. Designed for the layman desiring to extend his knowledge of the great painters before the nineteenth century as well as for the teachers of art and artists. (3F) **Reynolds**

36, 136. Development of Modern Art. Evolution of modern tendencies in art during the nineteenth and twentieth centuries. (3S) **Cornaby**

Art Education

34. Art for Young Children. Designed to meet the needs of child development majors, mothers in the home, kindergarten and first grade teachers. (3F) **Fletcher**

152. Art Methods for Elementary Grades. Methods of teaching drawing, painting, design and handwork in the elementary schools. A "must" in preparation of a grade school teacher. Prerequisite: Art 1 and 2 or 4. (3S) **Larson**

151. Art Education for High School. Methods of teaching art on the secondary school level. How to motivate the work in drawing, painting, design and crafts. Required of all majors and minors in art on secondary teaching level. Prerequisites: Art 1 and 2 or 4. (3W) **Staff**

Commercial Art

10, 110. Lettering-Layout. Design in advertising, display, layout, lettering, etc. (3F, W or S) **Thorpe**

35, 135. Commercial Illustration. Fashion design and illustration, advertising. (3 F, W or S) **Thorpe**

117. Commercial Portrait Painting. Drawing, illustrating and painting of portraits in various media. (2S) **Thorpe**

Crafts

111. Fabric Design and Application. Projects in creating designs of character and beauty and applying them to suitable textiles in techniques of block print, stencil, silk, screen, hooked rug, tie and dye batik. Prerequisites: Art 1 and 2. (2F or S) **Larson**

112. Ceramics. Art of making pottery, tiles, figurines, etc. (2F) **Wilson**

113. Art Metal, Jewelry and Lapidary. Art metal projects in hand-wrought copper, brass, pewter and silver, jewelry design and constructions, precision casting. (2F, W or S) **Cornaby**

114. Leathercraft. Design and construction of wallets, belts, bags, briefcases, holsters, bridles and related projects. Executed in techniques of modeling, carving, stamping, embossing, etc. (2F, W or S) **Cornaby**

118. Plastics. Creative use of plastics as an ornamental craft. (2W) **Cornaby**

119. General Crafts. A survey course designed to fit the needs of teachers and camp counselors. Simple projects are completed in leather, jewelry, art metal, textiles, plastics, clay and papier mache. (2F) **Cornaby**

Design—Structure and Organization

1. Art Structure and Design. Creative approach to line, mass, form, pattern, texture, color, and their combined relationship to design construction. (3F, W or S) Sections limited to 20 students. **Staff**

2. Design Creation and Application. Problems in creating designs for application to specific projects. Instruction is adapted to the individual, satisfying the needs of teacher, homemaker, hobbyist, or scout, summer camp and recreational counselors. (3F, W or S) Prerequisite: Art 1. **Staff**

7. Freehand Drawing. Objective drawing of natural forms from observation and memory in various media. A desirable prerequisite to all painting courses. (2F or S) **Larson, Wilson**

4. 104. Creative Expression. Studio experience in developing spontaneous expressions and freedom of graphic interpretation. Excellent for the layman who thinks that he cannot express himself artistically, but who has a desire to do so. For art majors who find it difficult to interpret their inner ideas. (2W) **Larson**

45. 145. Rendering Techniques. Pen and ink, pencil and related techniques. Designed to supply the needs of students in scientific drawing, landscape architecture and Commercial Illustration. **Fletcher**

107. Advanced Drawing and Composition. Continuation of freehand drawing. Prerequisite: Art 7. (2W, S) **Larson, Wilson**

124. Perspective. The principles of cylindrical, parallel, oblique and modernistic perspective as used in the arts. Suited to the needs of students of art and landscape architecture. (3F or S) **Fletcher**

125. Anatomy. Artistic approach to the drawing of human and animal anatomy. (2S) **Fletcher**

127. Advanced Design. Special problems in creating designs for furniture, leather, art metal, jewelry, ceramics, textiles, plastics, and mural decoration. Adapted to the needs of teachers, industrial artists, craftsmen. (3W) **Reynolds**

Graphic Art

140. Etching. A study of the unlimited possibilities for creative artistic expression through the use of metal plate as a printing medium. Techniques and uses of the burin, dry-point, soft-ground, hard-ground, acqua-tint, and acid bath in achieving desired effects are emphasized.

Interior Decoration

22. 122. Essentials of Interior Decoration. A foundation course including the study of historic styles and the analysis of art elements and principles of design as applied to home planning and furnishing. Prerequisites: Art 1 and 2. (3F or W) **Larson**

23. 123. Applied Interior Design. A study of the practical application of art elements and principles of design to problems of decoration and furnishing involved in producing homes of character, beauty, and livability. Prerequisite: Art 22, 122. (4W, S) **Larson**

175. Advanced Problems in Interior Decoration. Designed specifically for interior decoration majors. (3S) **Larson**

Painting

8. 108. Oil Painting. Introduction to the use of oil paint as an art media in various techniques. Emphasis on Landscape and still life. Desirable prerequisite: Art 7. (2F, W, or S) **Fletcher**

109. Watercolor Painting. Modern techniques. Desirable prerequisite: Art 7. (2W or S) **Cornaby**

Photography

1E. 61. Introductory Photography. Training in taking still pictures. The units include selection of materials; exposing and developing of films; contact printing; enlarging; and trimming and mounting of prints. This is the first of a series of units in photography having as their objective the preparation of technicians in this field. Three lectures, one 3-hour lab. (5F, W or S) **Allen**

1E. 64, 164. Motion Picture Photography. The technique needed in the various types of work in 8 mm. and 16 mm. cameras and projectors. Planning the production, camera technique, lighting, filters, close-up photography, tiles, editing and projection. Two lectures, three 3-hr. labs. (5S) **Reynolds**

1E. 65, 165. Portrait Photography. Training in portrait and group photography. The units include model directing, lighting, posing, head and shoulder, three quarter, full length, fashion, and group photography. Considerable emphasis will be placed upon child and home portraiture. Two lectures, three 3-hr. labs. (5W) **Allen**

1E. 66, 166. Color Photography. Problems in color, Ektachrome and Kodachrome, use of tungsten, daylight and flash technique, printing processes, composition in color arrangement. Prerequisite: Art 32. Two lectures, three labs. (5F) **Reynolds**

1E. 67, 167. Abstract Composition. Symbolic interpretation, texture studies, symbolism in portraiture, table-top technique, negatives combined with photographs, solarization and multiple exposure, and other techniques used in modern advertising and illustration. Two lectures, three labs. (5W) **Reynolds**

Sculpture

6, 106. Sculpture. Creative expression in a variety of plastic mediums, which will include wood, stone, plaster, clay and metals. This course emphasizes the esthetic employment of form and the technique necessary to casting, built up plaster modeling, beating metals, stone cutting, and wood carving.

Special Art Problems

171, 271. Special Studio Courses. Individual work on specific problems. This is a service course to all departments. However, art majors desiring work in Art 171 are required to take Art 1 and Art 2 as prerequisites. All criticism, assignments and supervision are given on Fridays at a time arranged between student and head of department. In some instances several instructors may be called in on the same project.

From one to five credits a quarter may be taken.

Cornaby: Art metal, jewelry, lapidary, precision casting, leathercraft, ornamental plastics, watercolor.

Fletcher: Scientific drawing, oil painting, watercolor, perspective, pen and ink illustration, architectural and landscape rendering, problems in art education for nursery, elementary and secondary grades.

Reynolds: Photography, art appreciation, architecture, interior decoration, color, design.

Larson: Design, interior decoration, textiles, silk-screen processing, stenciling, block printing, weaving, drawing, oil painting.

Thorpe: Commercial art, fashion drawing, illustration, portrait painting, design, advertising display, figure drawing, anatomical drawing, painting.

Wilson: Sculpture, modeling, ceramics, drawing, etching.

272. Art Research and Special Problems. Credit arranged. (F, W or S)

Education (*Administration*)

E. A. Jacobsen, Chairman

E. A. Jacobsen, John C. Carlisle, L. G. Noble, Professors;
Ben Van Shaar, Assistant Professor.

L. R. Humpherys, Professor Emeritus.

10. College and Life. Orientation course especially designed for freshmen but open to all students. (2F, W or S) **Chase**

Education 11. Restricted to Honor Residents in the dormitories. Various aspects of guidance conducive to helping new students adjust to college life. (2F) **I. Daniel**

50. Introduction to Teaching. Designed to orient the student to the profession of teaching. It affords opportunity to study qualifications essential to teaching success and to determine, in part, each student's aptitudes for teaching. Required of all candidates for teaching training curricula. **Staff**

114. Organization and Administration. Fundamental principles of organization and administration of schools in the American public school system with emphasis on Utah conditions. (3F or W) **Noble**

116. Articulation of the Educational Program. A survey of existing needs for close articulation of the various educational units and agencies. Discussion of factors conditioning nature and extent of articulation and of the unifying principles upon which a well articulated education program rests. (3F or W) **Jacobsen**

141. Social Education. The implications for education involved in social conditions and social change. The social significance of current educational theories and practices. (3W) **Noble**

181. School Finance. A study of the importance of finances in a school system and the principles and practices involved in the collecting and distributing of school revenues, with special reference to the conditions in Utah. (3F) **Jacobsen**

190, 191, 192. Intercultural Education. A sequence of courses planned in co-operation with other departments on the campus to acquaint the prospective teacher with ways and means of studying in the elementary and secondary schools the culture of other peoples. (1F, 1W, 1S) **Carlisle and Staff**

201. Background of Modern Education. An integration of the history and philosophy of education as a basis for understanding modern education. The evolution of educational thought, the sources of great philosophies of education in relation to their times. (5F) **T.B.A.**

211. Educational Measurements and Statistics. The fundamental principles of measurement tests and test construction, statistical analysis, and evaluation procedures in education. (5W) **Jacobsen**

205. Reading and Conference. Provides for individually directed study in the fields of one's special interest and preparation. (1-2F, W or S) **Staff**

219. The Principal and His School. Practical problems confronting the principal in administration and supervision, in terms of the changing social scene and changing concepts of school administration. Problems of administration, supervision, curriculum, pupil personnel, school-community relations, as they apply to the work of the principal are given consideration. (3W) **Carlisle**

221. School Administration. A general study of the work of the school administrator and the principles upon which the profession of school administration is practiced. Federal, state, and local relations to education are discussed. (3W) **Jacobsen**

222. Administration of School Personnel. A study of principles and practices in the management of teacher and pupil personnel. (3S) **Jacobsen**

230. School Supervision. The principles and practices of school supervision including the qualifications and responsibilities of the supervisor. (3S) **Carlisle**

237, 238, 239. Educational Seminar. Gives opportunity for the investigation and report of individual problems and for group discussion and criticism on

these reports. Minimum of one quarter required of all Education majors. (1F, W or S) **Staff**

251. 252. 253. Master's Essay. Individual guidance in the preparation of research papers as part of research requirement for the Master of Science degree.

267. Introduction to Research. An inquiry into the nature and sources of research problems with a study of underlying principles and methods of working out such problems in education. Some attention is given thesis writing as a problem related to research. (2W) **Carlisle**

271. Research and Thesis Writing. Provides for individual work in thesis writing with the necessary guidance and criticism. (F, W or S) **Staff**

Education (*Elementary*)

———, Chairman

Caseel Burke, Edith Shaw, Assistant Professors; Ellen Humphery,

Fern Nicholes, Myrtle Jensen, LaRue Parkinson, Alice

Chase, Cleo Bishop, Hazel C. Clark, Instructors.

In connection with the general requirements for the Bachelor of Science degree, the following requirements must be met:

- (1) Courses designed to provide a broad liberal background. These must include ten credits in each of the four basic fields of knowledge: social sciences, biological sciences, physical sciences and mathematics, and language arts; and six credits in fine and practical arts.
- (2) Thirty credits in one field of concentration or 18 credits in each of two such fields.
- (3) A major of 45 credits in professional study selected from the following divisions:

Group I. Understanding the Child—Minimum 9 credits: Psychology 105, 181, 182, 183, 123, 145, Physical Education 84, Public Health 155, Speech 107, Child Development 60.

Group II. Understanding the School—Minimum 6 Credits: Education 103, 114, 116, 141, 201, Psychology 161.

Group III. Curriculum and Methods—Minimum 12 credits: Education 104, 105, 107, 108, 109, 161, Psychology 108, 127, English 24, Speech 18 or 118, Music 130, Art 152, Physical Education 177, 182, Child Development 175A.

Group IV. Student Teaching—Minimum 12 credits: Education 106, Child Development 175b.

Group V. Electives—may apply on 45-credit major: Psychology 161, 140, 112, Education 110, 145, 165, 181, 194, 203, 205, 211, 219, 221, 237-8-9.

Selection of the program of study should be under the guidance of the major professor. Completion of a major in Elementary Education includes all requirements for a Utah general elementary certificate.

103. Principles of Elementary Education. Aims, functions, work and attainable goals of the elementary school as an integral part of the American system of education; its relations with the community and the other schools of the American series. Part of the work of the course will be devoted to observation and analysis of practices and procedures in selected elementary schools within the vicinity of the College. Two hours of observation weekly. Time arranged. (4F, W, S) **Burke**

104. Elementary School Curriculum. Designed to familiarize prospective elementary teachers with the content of the elementary curriculum, the objectives and standards to be realized in the grades, and to extend the student's scholarship in the various fields explored by pupils of the elementary school. (3F, W, S) **Burke**

105. Principles of Teaching in Elementary School. The purposeful activity of the child as the basic principle determining teaching procedure. The purpose

and meaning of subject matter in light of the foregoing thesis. Significance of the fact of individual differences in its application to school room practices. Consideration of schoolroom equipment and of organization and play activity. (5F, W or S) **Shaw**

106. Student Teaching in Elementary Schools. For juniors or seniors who have had Educational Psychology and Principles of Education. The apprentice plan is followed which requires an initial period of observation with minor responsibilities but with gradual increase of work and responsibility as trainee's ability is demonstrated. Registration for all quarters should be arranged for at the time of fall registration. Any quarter, time arranged. Students who have credit for other courses in practice teaching, or who have successful teaching experience, may register, by special permission of the instructor, for less than 12 credits. (F, W or S) **Shaw and Supervising Teachers**

107. The Teaching of Reading. Objectives, standard of attainment and methods of reading instruction; diagnostic and remedial techniques at the elementary and secondary level; reading in the activity program. (3F) **Burke**

108. Social Studies in the Public School. Social responsibilities and opportunities of children and youth in the present and postwar world. The part that should be played by the school and the teacher in helping boys and girls to meet these problems is studied. This will deal both with content and methods in social studies for the public schools. (3W) **Burke**

109. Arithmetic and Science in the Elementary School. Materials and methods most suitable to the attainment of the objectives of the arithmetic and science programs. Approximately one-half of the term allotted to each subject. (3S) **Burke**

110. Diagnostic and Remedial Teaching. Specific objectives of the elementary school and methods of analyzing the extent to which these objectives are reached. Diagnostic and remedial measures with respect to various areas of the curriculum. (2S) **Jacobsen**

245. Problems in Elementary Education. Consideration given those fields of elementary education which the members of the class desire to investigate, with a view toward gaining modern authoritative viewpoints. Opportunity provided for both individual and group work. (2S) **Burke**

Education (Secondary)

John C. Carlisle, Chairman

John C. Carlisle, L. G. Noble, Professors; Israel Heaton, Helen Cawley, Assistant Professors; Pearl S. Budge, Instructor.

L. R. Humpherys, Professor Emeritus.

For a major in Secondary Education the student must complete at least 36 credits of professional work in Education and Psychology. The major field of study must be distributed approximately as follows:

- (1) Nine credits in the field of understanding the pupil: Psychology 102; Education 113; Public Health 155; Psychology 105, 123, 140, 145, 181, 182, 183, 202, 285 or Physical Education 84 or 192.
- (2) Six credits in the field of understanding the school: Education 111, 114, 116, 201, 141.
- (3) Fifteen credits in student teaching, methods and curriculum: Education 111, 127, 129, 130, 107, 108, 115, 161, 164; Art 151; English 123; Speech 123, Sec-retarial Science 179 or 180; Music 121, 122 or 123; Physical Education 20, 130, 160, 163.

Note: Courses in group (3) above other than Education may be elected only by students with teaching majors in the specific fields indicated.

Students majoring in other departments who wish to complete only the requirements in Secondary Education for a Utah teaching certificate must complete

the total of 30 credits distributed according to the above groups plus an additional three credits of elective work in Education or Educational Psychology.

A teaching major of not less than 36 credits, of which 15 credits must be Upper Division, and a teaching minor of 18 credits in subjects taught in high schools are required of majors in secondary education. In lieu of a teaching major and minor, a composite teaching major may be selected. Such a major consists of not less than 60 credits in two or more related subjects with a minimum of 18 credits in any field included in the composite major. Composite majors are offered in the following fields: Social Science, Language Arts, Physical Science and Mathematics, Biological Science, Commercial Education.

Selection of a program of study should be under the guidance of the major professor. Completion of a major in Secondary Education includes all requirements for teacher certification in nearby states. Students wishing to prepare for teaching in any of these states should consult the office for information.

111. Principles of Secondary Education. The background and present status of the secondary school in the United States. Problems of objectives, curriculum, methods, and pupil personnel are considered. (3F. 3W. 3S) **Carlisle**

113. Principles of Guidance. Major emphasis given to organization of guidance as a service, including individual and occupational differences, tests, measurements, and counseling. (3; F, W or S) **Van Shaar**

115. Secondary School Curriculum. The nature and function of the curriculum. Different view points respecting the curriculum, and examples of new type curricula now attracting attention in various parts of this country are examined and evaluated. (3S) **Carlisle**

123. The Teaching of English. A practical course for those who are either teaching or planning to teach English in public schools. The purpose is to study materials and methods in the three fundamental areas of English instruction: grammar, composition, and literature. (3F) **Hayward**

123. Teaching of Speech. The methods and problems peculiar to the teaching of Speech. The organization of courses and lesson plans is included. Students may register only with permission of instructor. (2F) **Myers**

127. Secondary School Methods. General methods of teaching in the secondary school. Such matters as teacher personality, planning instruction, study procedures, types of teaching, adapting classroom practices to individual differences, testing and evaluation, all are included. It is recommended that the course be taken the same quarter with Ed. 129. (2F. 2W. 2S) **Carlisle, Budge**

129. Student Teaching in the Secondary School. Required for certification. Students may be enrolled only after completing Psychology 102, Education 111, and at least 18 credits in the field in which they expect to do student teaching. Education 127 should be taken during the same quarter. It is recommended that Education 130 also be taken the same quarter, in which case at least two periods per day are required (one for each course), in addition to one hour per week, 4 to 5 o'clock for group discussions. The student is assigned to a sponsor teacher in the secondary school. A brief period of observation is followed by gradually increasing responsibilities until upon completion of the two courses, the student has had guided experiences in all professional responsibilities of the typical faculty member in the junior or senior high school. (5F. 5W. 5S)

Carlisle, Budge, Heaton

130. Student Teaching in the Secondary School. A continuation of Education 129, which must precede it or be taken concurrently. (5F. 5W. 5S)

Carlisle, Budge, Heaton

150. Teaching of Mathematics. The objectives in the teaching of mathematics on the elementary and secondary school levels, and materials and methods most conducive to the attainment of these objectives (3S) **Tingey**

151. Art Education for High School. Methods of teaching art on the secondary school level. How to motivate the work in drawing, painting, design and crafts. Arrangement of the shop, studio, selection of tools, and supplies. Required of all majors and minors in art on this level. Prerequisites: Art 1, 2. (2W) **Staff**

161. Audio-Visual Aids in Education. Emphasizes the importance of audio-visual aids in the school program. Building a workable program in which are utilized the newest materials and techniques. (3F) **Noble**

179. Methods of Teaching Typewriting. Recent development and practice in the teaching of typewriting. The analysis of objectives, laws of learning, organization of materials, texts, standards of achievement, methods of acquiring speed and accuracy are considered. For those preparing to teach typewriting and those engaged in teaching who wish to render their teaching more effective. (3F) **Neubergor**

180. The Teaching of Shorthand. Newer methods and trends in the teaching of shorthand, and observation and practice in shorthand classes for those preparing to teach. (Consult instructor before registering.) (3F) **West**

237. Problems in Secondary Education. For graduate students in secondary education and those preparing for school administration or supervision at the junior-senior high school levels. Deals with a review of research in the field together with emphasis upon areas of particular concern to members in the class. (3W) **Carlisle**

Education (Vocational)

L. R. Humpherys, Chairman

Helen Cawley, Associate Professor

Candidates for a teacher's certificate in the several fields of Vocational Education need to comply with the Utah Certification requirements. The following courses are suggested:

Agriculture Basic: Psychology 102, Education 112, 113, 114, 125, 126; Bacteriology 155; Elective, 3 credits.

Home Economics Basic: Psychology 102; Education 114, 120, 121, 122; Bacteriology 155; Public Health 155; Elective, 7 credits.

112. Principles of Vocational Education. Social and economic bases for vocational education and its relation to general education. Fundamental principles and practices in vocational education. (3W) **Humpherys**

120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; an appreciation of methods of teaching in education for home and family living. Prerequisite or parallel: Psych. 102.. (3F or S) **Cawley**

121. Problems in Teaching Home Economics. Recent investigations in Home Economics and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) It is suggested that this course be blocked with Education 122 and with one other three-hour Education course so that concentrated work may be taken on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4W or S) **Cawley**

122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teachers leave the campus the middle five or six weeks of Fall or Winter Quarter and teach a full homemaking program each day in an approved school. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Education 121 and 122, preferably at the beginning of her junior year, to make other arrangements for her student teaching. In the latter case, the student teacher teaches at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8W) **Cawley**

123. Student Teaching in Home Economics for Non-Vocational Education Majors. For student dietitians whose responsibilities will involve teaching student dietitians, and patients. For other non-vocational homemaking education majors interested in securing practical teaching experience. In Spring the

student teacher teaches at least one hour daily in an approved local school. Prerequisite: Ed. 120, with Ed. 121 taken the same quarter as Ed. 123. (4S)

Cawley

Field Trip. For senior girls and graduate students enrolled in homemaking education. Trip planned cooperatively by students and homemaking education staff. Trip will probably take place during Spring Quarter, and the estimated cost will be given in advance.

124. Methods of Teaching Farm Mechanics. Scope of mechanics in agriculture, lesson planning, course of study preparation, shop equipment and management, skill requirements, and supervised practice. (3S)

Humpherys

125. Methods of Teaching Agriculture. For teachers of vocational agriculture. Fundamental principles and practices of teaching, selection, and organization of subject matter and supervision of agricultural activities on the farm. (5W)

Humpherys

126. Directed Teaching in Agriculture Student observation and teaching in approved local vocational agricultural departments under supervision. Trainees are expected to leave the campus to train in selected high schools of the state for a full teaching program. (4-8 W or S)

Humpherys

199. Special Problems in Home Economics Education. Developed around individual needs of students which are not otherwise provided for in curriculum. (1-2 F, W or S)

Cawley

210. Research for Master's Thesis. Credit arranged.

Cawley

225. Special Problems in Agricultural Education. A consideration of needs of individual students and special types of service. (1-2S)

Humpherys

226. Organization of Adult Instruction. The fundamental concepts in the organization and instruction of adults, principles and techniques of teaching adult classes. (3S)

Humpherys

237. Seminar. Home Economics Education. Gives opportunity for investigation and reporting on individual problems.

Cawley

Graduate Work

Graduate study in the Department of Education leads to the Master of Science degree in Education or to the Five Year Diploma. All courses listed in the department are applicable to either the degree or the diploma with the exception of the following: Ed. 103, 104, 105, 106, 114, 129, 130.

Library Science

King Hendricks, Chairman

Library Science may be used as a teaching major or minor in connection with a major in Education. This course prepares the student for a librarian certificate as issued by Utah State Board of Education and for a position as school librarian on the elementary or secondary level. It also provides background for advanced training in librarianship. A teaching major of not less than 30 credits or a minor of not less than 18 credits must represent credits selected from each of three groups of courses including courses marked*.

Group 1: Technical processes 1, 113, 120*; Eng. 111; Educ. 161; Art 110.

Group 2: 100*, 155*, 160; Eng. 24, 40, Any upper division course in Literature; Speech 18; Educ. 107.

Group 3. Administration 150*; Educ. 104, 105; Psychology 110.

1. Library Procedures. Designed for library employees. Procedures and techniques of library operation including circulation, reserve, and all branch libraries. Open to prospective employees of the library and required of all student employees of the library. Restricted to 20 and open only to freshmen and sophomores upon consultation with the instructor. (2F, W or S)

Abrams

100. Reference Materials and Bibliography. Principal reference tools in each field are studied. Reference materials for school, public, and college libraries are included. (3W) **Smith**

106. Bibliographic Research in Agriculture. A study of the journals and technical reference materials, including use of indexes, bibliographies, abstracts, and technical journals. (1F or W) **Logan**

113. Book Repair and Binding. Methods of book repair, necessary bindery records, and the history of book binding. (2S) Fall **Buehler**

120. First Quarter Cataloging and Classification. Classification of books according to the Dewey decimal system and cataloging instruction adapted primarily to the use of school and public libraries. (3F) **Smith**

121. Second Quarter Cataloging and Classification. A continuation of the work undertaken in Library Science 120 which is a prerequisite to this course. **Smith**

150. School Library Administration. The theory of school library work with emphasis on demonstration and practical application. (3S) **Smith**

155. Book Selection. Methods and principles of book selection and book ordering. (3S) **Smith**

160. The Art of the Book. The history of bookmaking and printing. (1) **Staff**

Music

N. Woodruff Christiansen, Professor, Chairman, Instrumental Division; **Walter Welti**, Professor, Chairman, Vocal Division; **George Pahtz**, Instructor.

MUSIC MAJORS. Music majors may specialize in vocal music, instrumental music, or piano. The following courses are required in all three fields: Basic Music I, 9 credits; Basic Music II, 9 credits; Piano, 4½ credits. Each music major will present or participate in a public recital or take a major role in an opera.

Major students will, in addition, complete courses in field selected as shown below:

VOCAL MUSIC. Band and Orchestra Methods, 6 credits; School Music Methods, 5 credits; Chorus, 6 quarters; Music History, 3 credits; Conducting, 3 credits; and the ability to play third grade piano music at sight.

INSTRUMENTAL MUSIC. Six quarters of band and three of orchestra or three quarters of band and six of orchestra; Band and Orchestra Methods, 9 credits; Music 80, 81; Music 114; Music 101, 102, 103, 106, 173, 174, 175; three quarters or equivalent of private instruction on instruments recommended by the major professor.

PIANO. Six quarters (9 credits) private piano, 6 quarters (9 credits) choral or 3 quarters choral and 3 quarters orchestra or ensemble, Music 80-81, 18 credits basic music, Music 106, 114. Students in piano may elect as major professor the chairman of the vocal division or the chairman of the instrumental division.

1. The Art of Listening. Designed to enhance the general listener's appreciation of music through the use of selected reproductions. Non-technical collateral reading and reports will be assigned. (3F) **Welti**

3, 4, 5. Fundamentals of Music and Sight Singing. Notation, scales, intervals and keys in major and minor modes, and their applied use in reading music. (3F, 3W, 3S) **Welti**

6. Aggiettes, Band Auxiliary. A selected group of girls of uniform size who assist the band in half-time football shows. One credit in physical education is allowed. (1F)

15, 16, 17 or 115, 116, 117. String Ensemble. Composed of capable string players performing as a group. Music specially arranged for a large string group will be used. (½F, ½W, ½S) **Pahtz**

18, 19, 20 or 118, 119, 120. Symphony Orchestra. Provides training and practical experience in a wide range of orchestral works including symphonies and the annual opera score. Students below junior standing register for 18, 19, 20. (1½F, 1½W, 1½S) **Christiansen**

24, 25, 26 or 124, 125, 126. Chorus. Open to all students with a normal singing voice. Auditions to determine the part you sing are announced at rehearsal. Ladies meet Tuesday, Thursday and Friday. Men meet Monday, Wednesday and Friday. Auditions before registering are required in Winter quarter only. (1F, 2W, 1S) **Welti**

27, 28, 29. Opera Production. A practical study of the details involved in the production of opera. Students enrolled become members of the production staff and are assigned specific tasks in the preparation of the opera. (2W) **Welti**

131, 132. School Music Methods. One year of Basic Music, or one year of Sight Singing must be completed before any student is allowed upper division credit. Fall quarter is given to methods in nursery school and lower grades; Winter quarter to upper grades; Spring quarter to high school. (5W, 5S) **Odd**

35, 36, 37. Small Ensembles. Offers an opportunity for good voices to organize into trios, quartets, and other small units. See instructor before registering. (1F, 1W, 1S) **Welti**

41, 42, 43 or 141, 142, 143. Band. This organization is the college concert band. Concerts will be given and music furnished for athletic events. Students below junior standing register for 41, 42, 43. Students able to attend only three rehearsals per week should register for one credit only. (1-2F, 1-2W, 1-2S) **Christiansen**

44, 45, 46. Brass and Reed Groups. Brass quartets, sextets and woodwind trios, quartets or quintets. Members will be selected from applicants. (½F, ½W, ½S) **Pahtz**

74, 75, 76. Basic Music I. Diatonic harmony. Chord progressions and melody writing up to and including seventh chords. Keyboard harmony and analysis. (3F, 3W, 3S) **Christiansen**

80. Opera Appreciation. An intensive study is made of the world's best operas. Particular attention is given to the development of the orchestra as an essential part of the opera. By means of recordings the choicest musical selections are learned. (2F, 2S) **Christiansen**

81. Symphony Appreciation. Complete symphonies are given by the use of recordings. A careful study is made of their form and content. Biographical sketches of composers. (2W) **Christiansen**

84, 85, 86 or 184, 185, 186. String Groups. Offers opportunity for capable string players and pianists to organize into trios, quartets, and other small units. Standard literature is studied. (½-1F, ½-1W, ½-1S) **Pahtz**

93, 94, 95. Symphony Orchestra—Sectional Training. Provides training in phrasing, counting, and sight-reading symphonic works. (a) string section, (b) woodwind section, (c) brass section. (½F, ½W, ½S) **Pahtz**

101, 102, 103. Band and Orchestra Instruments. An individual study of assigned instruments with performance examinations. Required of all instrumental majors. Prerequisite, Music 121, 122, 123. (2F, 2W, 2S) **Christiansen**

106. History of Music. The development of music from its varied inceptions to the present. Lives of the most prominent composers. Effects of history on the development of music. (3S) **Welti**

114. Techniques of Conducting. The art and technique of effectively selecting, organizing and conducting group music. Style in expression. Use of the baton. Not open to freshmen. (3S) **Welti**

121, 122, 123. Band and Orchestra Methods. A study of the various instruments and the essential points in the teaching of them. Designed for students who may teach bands or orchestras or for general musical background. To precede student teaching. Fall, brass and percussion instruments; Winter, woodwind instruments; Spring, string instruments. (3F, 3W, 3S) **Christiansen**

127, 128, 129. Opera Staging. Open only to the opera cast and their understudies. Selections are made in the fall through competitive tryouts open to all students. Intensive study and rehearsing begins immediately after these selections are completed. (3W) **Welti**

135, 136, 137. Vocal Ensemble. Open only to members of the small choruses. Membership in these choruses is limited and competitive. Application may be made at any time, but auditions are announced only as vacancies occur. A good voice, and ability to read music are required. (1F, 1W, 1S) **Welti**

173, 174, 175. Score Reading. A course designed for all who expect to direct instrumental music, concentrating on the technique of reading scores. Practical application with performing groups. Recommended prerequisite: Music 114. (1F, 1W, 1S) **Christiansen**

177, 178, 179. Basic Music II. Chromatic harmony. The study of chord embellishments. Analysis of corresponding musical literature. Composition in small forms. (3F, 3W, 3S) **Christiansen**

Private Instruction Courses

N. Woodruff Christiansen, violin, band and orchestra instruments; **Walter Welti**, vocal; **George Pahtz**, cello; **INSTRUCTORS**—**Lucy L. Christiansen**, piano; **S. E. Clark**, piano and organ; **Maxine Greenwood**, vocal; **Thelma Lundquist**, piano; **Mischa Poznanski**, violin; **Jean C. Thatcher**, piano; **Patience Thatcher**, vocal; **Eldon Torbensen**, brass instruments; **Jeanne T. Welti**, piano; **Irving Wassermann**, piano.

The following courses are given through private study only. Appointments must be arranged with the instructor whom you select. For fees see page

NOTE: Students taking one lesson a week in any private music study, and getting the required amount of practice and preparation, shall register for one and one-half credits per quarter. Students taking two lessons and getting the required amount of practice and preparation shall register for three credits per quarter. Upper division credit will be given students of junior standing provided they have had at least two years, or equivalent, of previous study.

50P, 51P, 52P, 150P, 151P, 152P. Piano. Fundamental and advanced techniques. A study of material suited to the ability of the performers.

53P, 54P, 55P, 153P, 154P, 155P. Vocal. See statement for piano. **Staff**

56P, 57P, 58P, 156P, 157P, 158P. Wind Instruments. See statement for piano. **Staff**

60P, 61P, 62P, 160P, 161P, 162P. Violin. See statement for piano. **Staff**

63P, 64P, 65P, 163P, 164P, 165P. Cello. See statement for piano. **Pahtz**

66P, 67P, 68P, 166P, 167P, 168P. Pipe Organ. See statement for piano. **Clark**

Physical Education and Recreation

H. B. Hunsaker, W. B. Preston, Professors; **Elizabeth Dutton, Israel Heaton**, Associate Professors; ***J. K. Vanderhoff, Mary E. Whitney, Dale O. Nelson**, Assistant Professors; **Lois Downs, Vaughan Gordon, Blanche Chamberlain, Ray Watters, Don Brennehan**, Instructors.

INTERCOLLEGIATE ATHLETIC STAFF

Joseph E. Whitesides, Assistant Professor, Director of Athletics; **George Melinkovitch, Howard B. Linford, Paul Marston**, Assistant Professors; **Marvin T. Bell, George Nelson**, Instructors.

SERVICE COURSES

In the service courses of this department, an opportunity is given each student to perfect skills in some form of physical activity which will help establish

*On leave.

a permanent interest in healthful recreation of the active as well as passive type, the promotion of physical fitness, the building of moral and the maintenance of health.

A physical examination is given to all students at the beginning of each year in order to advise them properly as to the type of activity best suited to their individual needs.

Women students are required to take physical education service courses for six quarters. Classes may be selected by the student; and the same numbered courses may not again be taken for credit. Before a student may enter an intermediate or advanced course, in any activity in which she has completed and received credit for the elementary course, minimum service course requirements must have been satisfactorily completed.

It is recommended that all male students take some activity course in Physical Education. A wide range of courses in aquatics, dual, team, individual and outing activities are offered each quarter. Credit in physical education counts toward a college degree.

INTRAMURAL SPORTS

Intramural sports are conducted as a part of the program of the Department of Physical Education and Recreation. The Women's Athletic Association, in co-operation with the women's division of the department, sponsors and offers a wide and varied program of activities. All women students are eligible and encouraged to participate in any or all of the sixteen sports offered during the year. Women's intramurals strive to provide "a sport for every girl and a girl for every sport."

The department carried on an extensive organized Intramural sports program for men. Competition in 12 to 16 sports is carried on in four separate leagues, fraternity, department, club, and all-campus. All male students are eligible and encouraged to participate in one of these leagues.

The function of the intramural program is to give every student moral, social, physical, and educational values derived from competitive athletics. The program of athletics provides for both individual and team endeavor, "athletics for all," which is the purpose of intramural sports.

RECREATION

The Department of Physical Education and Recreation aims to meet the recreational needs and interests of every student, whether he is being trained in agriculture, engineering, business, or other professional fields.

This department will try to prepare the future farmer, banker, teacher or doctor for wise use of his leisure time. After courses in this department, students should be so interested in recreation that they will be valuable aid to any community.

Awards will be given to managers of various recreational groups and individual awards for special achievement. There will be groups organized in hiking, water sports, winter sports, tap dancing, fencing, archery, horse shoes, tennis, golf, badminton, boxing, swimming, tumbling and social dancing.

Professional Study in Health, Physical Education and Recreation

The Department of Physical Education and Recreation is prepared to offer major study with specialization in the following fields: Physical Education, Dance, Elementary Physical Education, Secondary Physical Education, Recreation and Health. It is recommended that in many study programs it would be desirable that a composite study program involving two of the above programs be selected to meet the major, minor requirements. In such cases, approximately 35 credit hours should be selected in each division.

The Physical Education and Recreation Department is closely correlated with various other major divisions of the college, as well as the School of Education in training its majors.

Study Leading to the B.S. Degree

Majors or Minors in the Department of Physical Education and Recreation will fulfill the basic physical education requirement by completing the fundamentals sports courses, physical education 20, 21, 22, 30, 31, 32, or 94, 95, 96, 97, 98, 99, in lieu of the 6 credits required for graduation, except in the case of majors or minor in dance they complete P.E. 24, 25, 26, 77, 78, 79.

Teaching Majors in Elementary Schools must complete Physical Education 24, 25, 26, 81, 84, 85 or 92, 104, 177, 180 or 181, 182, 183, 191. Six credits in Sports Techniques and 11 credits from the following: Physical Education 55, 86, 87, 111, 112, 150, 184, 192.

Teaching Majors in Secondary Physical Education must complete the following courses: 25, 75, 83, 84, 106, 183, 184, 191, and 10 credits in Technique of Sports. In addition, women must complete 24, 26, 77, 78, 79, 81, 92, 150, 180. Men must complete 3, 85, 181, 188, 189, 190. Suggested Electives: 55, 86, 87. Education prerequisites 120 or 160 and 192.

Teaching Majors in Dance must complete Physical Education 72, 76, 81, 83, 84, 102, 103, 104, 106, 111, 140, 150, 151, 153, 180; Speech 20 or 120, 150; Textiles 105.

To meet the needs of the Secondary School or Composite Major of Dance and Physical Education is highly desirable with the following courses applying to the Dance credits: Physical Education 72 or 76, 81, 83, 102, 103, 104, 111, 150; Speech 20, and thirty credits selected from the following in Physical Education: 75, 84, 92, 106, 161, 162, 163, 164, 165, 180, 183, and 184. Physical Education 94, 95, 96, 97, 98 and 99 satisfy the graduation requirements in Physical Education and Physical Education 160 and 192 are used as Secondary Education Certification Requirements.

Majors in Recreation must complete the following: 3, 25, 75, 83, 84, 85, 153, 179, 183, 196; 6 credits Sports Techniques, 6 credits Sociology, 10 credits related fields of arts, crafts, music, dramatics and photography, one summer field work in recreation.

Health Education Majors should take: Bact. 1; Public Health 50, 141, 142, 143, 144, 155, 156; Physical Education 55, 84, 106, 191; Psychology 33, 53, 105; Foods and Nutrition 5; Sociology 60, 70; Social Work 162; Zoology 1, 111; Speech 5, 67; Physical Science 31, 32 and additional courses to meet secondary education certificate requirements.

Composite Teaching Majors in Health and Physical Education should take: 75, 83, 85, 106, 120-1-2, 130-1-2, 181, 183, 184, 188, 189, 190, 191, 192; Public Health 50, 141, 142, 156; Sociology 60, 70; Psychology 33, 53; Foods and Nutrition 5; Social Work 162; Zoology 2, 111; Speech 5, 67; Physical Science 31, 32.

Minors in Health Education should take 50, 165, P. E. 84, Nut. 5,—3 credits from the following: P.H. 141, Psy. 151, Soc. W. 162, Soc. 60, P.E. 50.

To meet the needs of the secondary schools a composite major of health and some other closely allied subject is highly desirable.

Master of Science Degree in Physical Education

The Department of Physical Education and Recreation offers work leading to the Master of Science degree in physical education or recreation. Before admission to candidacy for the degree, a student must complete the equivalent of a Bachelor's Degree in physical education at Utah State Agricultural College and additional requirements as required by the graduate school. Required courses are: P.E. 192, 250, 271, 295, 299, Ed. 267, Eng. 211.

Students entering the department for graduate study should select supporting fields from one or two other areas of the school, closely allied to physical education and recreation, from which graduate courses will be selected. Suggested areas and courses are:

Education 201, 211, 219, 221, 230, 237.

Health 160, 166, Bac. 144, 151, 168, 201.

Sociology 141, 152, 154, 160, 170, 172, 202, 222, 240, 250, 270, 280.

Psychology 107, 110, 120, 140.

INTERCOLLEGIATE ATHLETICS

Intercollegiate athletics, inspired by the highest ideals and conducted on a high plane, provide an excellent course in training for citizenship and the preparation to wrestle with life's problems.

In high schools and college competitive athletics become a great factor for student body consciousness and oneness and an outlet for great enthusiasm born of loyalty. They pay dividends in good health, physical development and such manly qualities as courage, self-control and the spirit of cooperation.

Every student at the college is given an opportunity to try-out for the various teams. Attractive schedules with teams representing other colleges are arranged in football, basketball, track and field, baseball, swimming, wrestling, tennis, golf and skiing.

The College has an attractive Stadium where the games are played, and the Field House seats 4,500 people for basketball contests. It also provides practice areas for other teams.

A splendid spirit of cooperation exists between the Intercollegiate Athletic Department and the Department of Physical Education and Recreation, proper.

COLLEGE HEALTH SERVICE

The Health Service is maintained primarily for the care of students who may become ill during their stay on the campus. This service is also looked upon as an educational department to teach preventive medicine and hygiene. Through consultations, examinations and advice it attempts to point out the causes of ill health, and to present clearly the fundamental laws of good health.

SERVICE COURSES FOR MEN

2. Football. (1F)	Melinkovich
4. Boxing. (1F, 1W, 1S)	Staff and G. Nelson
5. Boxing. (Advanced) (1F, 1W, 1S)	Staff and G. Nelson
7. Wrestling. (1F, 1W, 1S)	G. Nelson
8. Wrestling. (Advanced) (1F, 1W, 1S)	G. Nelson
12. Track. (1S)	Linford
14. Handball. (1F, 1W, 1S)	Staff
15. Softball. (1S)	D. Nelson
16. Swimming. (Beginners) (1F, 1W, 1S)	Vanderhoff
17. Swimming. (Intermediate) (1F, 1W, 1S)	Vanderhoff
23. Basketball. (1F, 1W, 1S)	Whitesides
26, 27, 28. Restricted Gymnastics. For students physically unable to take required physical education. Students may register only after consultation with head of department. (1F, 1W, 1S)	Staff
29. Sigma Delta Psi. (1S)	Heaton
34. Soccer. (1F)	D. Nelson
35. Volley Ball. (1W)	D. Nelson
37. Tumbling. (1F, 1W, 1S)	Heaton
38. Tumbling. (1F, 1W, 1S)	Staff

SERVICE COURSES FOR WOMEN

P.E. 6. Band Auxiliary. A select group of girls of uniform size, who will assist the band at half-time football shows, etc. (1F)

39. Soccer-Speed Ball. (1F)	Jensen
40. Volleyball. (1F, 1W)	Dutton
41. Basketball. (1F, 1W)	Whitney
42. Softball. (1S)	Jenson
43. Field Hockey. (1S)	Dutton
44. Tumbling and Stunts. (1W, 1S)	Dutton

45, 46, 47. Restricted Activities. For students physically unable to take the required work in physical education. Students may register only after consultation with head of department. (1F, 1W, 1S) **Jensen**

48. Modern Dance. (Elementary). Fundamental movement techniques, elements of rhythmic and musical patterns. Relation of dance to other arts. Directed composition. (1F, 1W, 1S) **Whitney**

49. Modern Dance. (Intermediate). Further practice in technique involving greater control and experimentation in the possibilities of movement. Student directed studies in elementary composition. (1W, 1S) **Whitney**

52. Swimming. (Elementary) (1F, 1W, 1S) **Dutton**

56. Swimming. (Intermediate) Prerequisites: P.E. 51 or satisfactory completion of elementary minimum service course requirements. (1F, W or S) **Dutton**

58. Rifle. (1F, 1S) **Staff**

59. R.O.T.C. Sponsor. (1W) **Staff**

60. Body Conditioning and Physical Fitness. Theory and practice of body conditioning. (1F, 1W, 1S) **Whitney**

141. Modern Dance. (Advanced) Prerequisites: P. E. 48, 49 and consent of instructor. Further practice and development in techniques and composition of modern dance. (1W, 1S) **Whitney**

SERVICE COURSES FOR MEN AND WOMEN

- | | |
|--|-------------------|
| 1. Hiking. (1F, 1S) | D. Nelson |
| 3. Winter Sports. (1W) | Vanderhoff |
| 9. Fencing. (Elementary). (1F, 1W, 1S) | Downs |
| 53. Fly Tying. (1W, 1S) | Staff |
| 54. Casting. (1W, 1S) | Staff |
| 61. Archery. (1F, 1W, 1S) | Jenson |
| 66. Badminton. (1F, 1W, 1S) | Downs |
| 67. Tennis. (Elementary) (1S) | Staff |
| 68. Folk Dance. (1F, 1W) | Whitney |
| 70. Tap Dancing. (1F, 1W, 1S) | Jenson |
| 72. Social Dancing. (1F, 1W) | Heaton |
| 73. Golf. (1S) | Vanderhoff |
| 74. Life Saving. Prerequisites: Ability to swim and permission of the instructor. Proper American Red Cross Certification is given those students who pass the examination. (1W) | Vanderhoff |
| 90. Tennis. (Intermediate) (1S) | Vanderhoff |
| 116. Swimmers. (1F, 1W, 1S) | Vanderhoff |
| 136. Golf. (Advanced) (1S) | Vanderhoff |
| 155. Diving. Prerequisite: Swimming. (1S) | Vanderhoff |
| 161. Archery. (Advanced) Prerequisite: 61. (1W, 1S) | Jenson |
| 166. Badminton. (Advanced) Prerequisite: P.E. 66, (1F, 1W, 1S) | Hunsaker |
| 167. Tennis. (Advanced) Prerequisite: P.E. 67. (1S) | Dutton |
| 168. Square Dancing. (1F, 1W, 1S) | Heaton |

THEORY AND PROFESSIONAL COURSES

Sp. 20. Playground Dramatics and Pageantry. See Speech 20.

20, 21, 22. Fundamental of Sports. A freshman laboratory course for men Physical education majors. These courses are prerequisites for P.E. 120, 121, 122. (1F, 1W, 1S) Not taught 1950-51. **Heaton**

24, 25, 26. Dance Laboratory. For teaching folk, square and tap to freshman and sophomore women majoring or minoring in physical education or dance. The material presented from a survey standpoint. (1F, 1W, 1S) Not offered in 1950-51. **Whitney**

30, 31, 32. Fundamentals of Sports. A sophomore laboratory course for men physical education majors. These courses are prerequisites for P.E. 130, 131, 132, and are a continuation of the freshman class. (1F, 1W, 1S) **Heaton**

43. Recreational Crafts. See Industrial Arts. 43.

55. First Aid. Standard American National Red Cross course in first aid with emphasis on practical use of the knowledge as applied to everyday life in various occupations. Detailed demonstrations and practice. American Red Cross First Aid certificate may be obtained by students who pass a satisfactory examination. (3F, 3W) **Staff**

75. Backgrounds of Physical Education. Designed to acquaint the student of physical education with the background, growth and trends in physical education. Physical education's role in the developments and adjustments of the individual and the qualification, responsibilities and training are given consideration. (3F) **Downs**

77, 78, 79. Dance Laboratory. For teaching the techniques of beginning, intermediate and advanced modern dance to freshman and sophomore women majoring in physical education or dance. (1F, 1W, 1S) **Whitney**

81. Rhythms and Dramatic Games. Music for young children and its use in creative movement. Methods of presenting and developing rhythms are studied. (2F) **Whitney**

83. Playground and Community Recreation Leadership. Lectures and practical work. Lectures consider selection of suitable material and methods of handling various groups. (4S) **Heaton**

84. Normal Growth and Development. Traces the individual through the various stages of growth and development with special emphasis on principles and function of play. (3S) **D. Nelson**

85. Organization of Intramural Sports. Organization and administration of the intramural sports program for secondary schools. Sports, tournaments, units of competition, scoring systems and the coordination of intramural sports with physical education and athletics are considered. (3W) **Hunsaker**

86, 87. Sports Officiating. Knowledge of rules, mechanics of officiating, proper instructions to other game officials such as timers and scorers, and game administration. (2F, 2W) **M. Bell**

92. Organization of Intramural Programs for Women. Organization of sports days, play days, tournaments and the administration of intramural activities for women. (2W) **Jenson**

94, 95, 96. Physical Education Laboratory. For teaching team sports fundamentals to freshman and sophomore women majoring or minoring in physical education. (1F, 1W, 1S) **Downs**

97, 98, 99. Physical Education Laboratory. For teaching individual sport and dance fundamentals to freshman and sophomore women majoring or minoring in physical education. (1F, 1W, 1S) (Not offered in 1950-51.) **Jenson**

102. Dance Composition. Composition based upon the special elements of direction, level, and dimension. Experience in composing for an individual and for group. (2F) **Whitney**

103. Dance Composition. Composition based upon musical form. The following forms are covered: AB, Rondo, Theme and Variation, Canon and Round, Dance Suite. (2W) **Whitney**

104. Dance Production. Composition done independently and participation in a performance required: lighting, staging, costume and make-up applied to a dance concert. (2S) **Whitney**

106. Applied Anatomy and Physiology. A study of the anatomical and physiological structure of the human body in relation to adaptations made by the healthy body during mild and strenuous physical activity. (5F) **Dutton**

111. Creative Rhythms for Schools. Methods and materials in guiding the creative rhythmic experiences of students. Material applicable to elementary or secondary school. (3W) **Whitney**

113. Construction of Physical Education Equipment. Construction of and practice in the use of rhythmic instruments and play equipment. (3S) **Dutton**

120, 121, 122. Technique of Team Sports. For men students majoring in physical education. Prerequisites: P.E. 20, 21, 22. Students taught techniques of dual combatives and team sports. Each student expected to prepare a teaching syllabus of class work. (2F, 2W, 2S) Not taught in 1950-51. **Heaton**

130, 131, 132. Technique of Individual Sports. For men students majoring in physical education. Prerequisites: P.E. 30, 31, 32. Students taught technique of individual gymnastics, and aquatic sports. Each student expected to prepare a teaching syllabus for class work. **Heaton**

135. Safety Education. (a) The needs for safety education; (b) the role of the school in a program for safety; (c) methods and materials for teaching discussions, and readings, stressing various aspects of safety in many areas. (2W or S) **Staff**

140. Dance History. A history of dance from the primitive through Greek, Medieval, and Renaissance periods into the theatrical dance forms: Ballet and Modern. (3) **Whitney**

150. Methods in Dance. The place of the various types of dance in the physical education program. Emphasis given methods of teaching these activities and practice in teaching class members. A syllabus required of each student. (4S) **Whitney**

151. Techniques of Modern Dance. Advanced technique presented from the standpoint of the professional studio. Martha Graham technique and Humphrey-Weidman technique are covered. (3S) **Whitney**

153. Leadership in Dance. An advanced class in dance leadership to meet needs of students who expect to teach social or square dancing in schools or churches. One quarter of social or square dancing must be taken as a prerequisite. Emphasis on methods of teaching group dancing and creation of original routines. A syllabus is required. (2S) **Heaton**

157. Social Recreation Leadership. Designed to give practical experience in conducting social recreation activities by planning and conducting social recreation evenings for church school and civic groups. Prerequisite: P.E. 83. Time and credit arranged. (F, W or S)

160, 161, 162. Techniques of Team Sports for Women. Upper division students majoring or minoring in physical education are taught techniques of teaching and officiating team sports. **Dutton**

163, 164, 165. Techniques of Individual Sports for Women. Upper Division: students majoring or minoring in physical education are taught techniques of teaching and officiating the following individual sports: Fall: swimming, diving, and tumbling; Winter: archery, badminton, and fencing; and Spring: golf, and tennis. (2F, 2W, 2S) (Not taught 1950-51) **Dutton**

14. Water Safety Instructor's Course. Prerequisite: An American Red Cross Senior Life Saving certificate and permission of the instructor. Special attention is given methods of teaching swimming, diving, life saving and the use of small water crafts. Proper American Red Cross certification is given those students who pass the examination. (2S) **Vanderhoff**

179. Camping and Camp Craft. Training in camp technique and camp leadership. Different types of camps and their organization, supervision, equipment and safety are considered. Several short hikes and an overnight camp are conducted during the course. Each class member is expected to participate in these hikes. (2F, 2S) **D. Nelson**

180. Corrective Physical Education. (Women) Facts in body mechanics which contribute to the basic principle of posture. Analysis of postural deviations, their prevention and correction. Prerequisite: Physiol. 106. (3W) **Dutton**

181. Corrective Physical Education. (Men). A study of the facts in body mechanics which contribute to the basic principles of posture. Analysis of postural deviations, their prevention and correction. Prerequisites: P.E. 106 (3W) **Vanderhoff**

182. Physical Education in the Elementary School. A study of the characteristics of growth and development of the elementary school child with special reference to his needs in social and physical development which can be aided through physical activities. Practical experience in all areas of the well-balanced physical education program will be included. (5F, 5S) **Dutton**

183. Interpretation of Physical Education Objectives. Results and values of physical education activities under leadership in terms of development, adjustment and standards and their relationships as objectives. (5F) **Hunsaker**

184. Administration of Physical Education. Administrative procedures in the conduct of physical education in the high school; curriculum construction and program planning. (3W) **Hunsaker**

188. Methods in Football. Fundamentals of football, theory and practice, details of each position on the team, training, and managing, complete technique of developing offensive and defensive tactics. A comparison of the various systems in American intercollegiate football. (2F) **Melinkovich**

189. Methods in Basketball. Coaching and training of basketball teams, beginning with fundamentals; passing, dribbling, and pivoting, with emphasis on the psychology of the game; various methods of defense and offense. (2W) **Whitesides**

190. Methods in Track and Field. How to train for various track and field events; their form and technique; conduct of the athletic meets; construction, use, assembling of all equipment used by the participants on the field; development of certain types of individuals for certain events. (2S) **Linford**

191. Interpretation of the Health Examination. Examination procedures, the detection of physical defects, the general assessment of the health of the individual and the follow-up program. (3S) **Preston**

192. Tests in Physical Education. Practical studies of tests now in use and the technique of test construction. (3S) **Hunsaker**

195, 295. Problems in Physical Education. (F, W, S) Credits arranged. **Hunsaker**

196, 296. Organization of Recreation. Problems of organization and administration of community recreation departments, including staff, facilities, program of activities, and office management. Special problems of recreation surveys, legislation, property acquisition, finances, construction, and maintenance, and securing community and school cooperation in a united recreation program. (3W) **Heaton**

199, 299. Physical Education Seminar. (3F, 2W, 3S) **Hunsaker**

250. Reading and Conference. Provides for individually directed study. Credit arranged. **Hunsaker**

271. Research and Thesis Writing. Credit arranged. **Hunsaker**

Psychology

Arden N. Frandsen, Professor; **David R. Stone**, **Heber C. Sharp**, Associate Professors; **Robert L. Egbert**, Assistant Professor; Hospital Supervisors of Interns, **J. O. Cromwell, M.D.**, **E. A. Martin**.

Psychology is a scientific approach to understanding people; its main purpose is improvement of human efficiency, usefulness, and happiness. Courses in the Department of Psychology contribute, therefore, to both professional training and personal development of students in nearly every department of the College.

A major or preferably a master's degree in psychology should prepare students professionally (1) for guidance and psychological counseling in high schools; (2) for teaching psychology, study habits, mental health, and personality development in high schools, (3) for diagnostic and remedial teaching and for dealing with personality and conduct problems of children in the elementary schools and in child guidance clinics, (4) (with additional courses in Education) as a "special" teacher of exceptional children, (5) as clinical psychologists (with additional graduate training) in mental hygiene clinics and hospitals, (6) for personnel work (at the junior professional level) in industry, the U.S. Employment Offices, various Civil Service positions, and in the military services, and (7) for further graduate study in psychology, education, child development and social work. Psychology is also a suitable major for students planning to study medicine, nursing, law, and social work, or personnel work after graduating with a bachelor's degree.

The Department of Psychology has arrangements with schools, social welfare agencies, juvenile courts, the industrial school, and a mental hospital in which graduate students and some seniors may have practical experience in the general field of clinical psychology. The experiences include educational and vocational counseling; diagnosis and guidance of gifted, subnormal, and delinquent children; diagnosis and treatment of conduct and personality problems; diagnosis and remedial instruction for achievement difficulties in school subjects; teaching psychology in high school or college; teaching exceptional children; and for various kinds of psychometric work.

Lower Division Preparation for Psychology. The best preparation for psychology is basic training in biological science, social science, literature, mathematics and physical science. In completing the "group requirements," it is recommended that the following courses be included: Physiology 4; Sociology 70; English 40, 45, and other literature (novel and biography) courses; Mathematics 34, 35, and desirably additional mathematics courses for students with interest in the subject; Physics 7. The minimum of 40 hours in the "group requirements" might well be exceeded. Psychology courses for lower division students expecting to major in psychology are Psychology 53, 71, 80 and, if desired before attaining upper division status, 102, 105, and 112.

Requirements for a major in psychology include 40 credits of approved courses, from the following **basic:** Psychology 53, 71, 102 or 105, 112, 127, 140 or 145, 161, 181, 182, 183; and **elective:** from Psychology 80, 102, 105, 108, 114, 115, 121, 123, 140, 145, 155, 175, 191; Sociology 170; Education 110; Speech 167 or 173. As upper division electives, Zoology 111; Physiology 121, 122, 123; the Education courses for teacher certification; Sociology 130, 153; S. W. 270; and upper division courses in literature are also suggested.

A minor in psychology (which should include Psychology 53, 71, 102 or 105, 112, 127, 140 or 161, 181, and 183) is recommended for any high school teacher who expects to participate in the school guidance program, for social workers, for students majoring in speech correction, for students whose major is business administration, and for students majoring in other social sciences.

Master of Science Degree in Psychology. Programs of study for this degree are planned in consultation with the major professor and an advisory committee. A well-balanced program planned to meet the student's professional objectives may be arranged to include courses both from psychology and pertinent related fields. In the preparation for meeting the requirements for the Professional School Counselor's Certificate, for example, courses mainly from psychology and education would be chosen. Lists of the prescribed courses for this certificate and for other special professional objectives may be obtained from the Department Head. Besides the courses required for a specific professional objective, the Master of Science degree in psychology should include, as a graduate or undergraduate student, study in the following fields: (1) general and experimental, (2) systems and history, (3) learning, (4) child and adolescence, (included in educational), (5) clinical psychology, (6) mental hygiene, abnormal psychology and physiological, (7) social psychology (8) personality, (9) statistics, and (10) research (thesis). Besides additional courses from those listed in each of the above 10 areas, courses planned especially for graduate students are: Psychology 191, 202, 212, 214, 215, 216, 217, 223, 231, 284, 285, 286, 287 or 187, and 288. For students who have not majored in psychology, thirty hours of approved courses in psychology or closely related fields are a prerequisite to begin graduate study in psychology.

COURSES IN PSYCHOLOGY

33. Psychology of Personal and Social Adjustment. A course in mental hygiene for lower division students from every school in the College. How to acquire emotionally healthful patterns of behavior and to eliminate unhealthy patterns of behavior is considered. Mental hygiene principles are developed and these are applied to personal and social behavior in several major life activities—educational, vocational, family, recreational, and religious. (3F) Sharp

51. Psychology for Nurses. () Time arranged.

Staff

53. Elementary General Psychology. General principles of human behavior and experience including: nature of personality; factors determining development; how we learn, observe, and think; motives of human conduct; dealing with people; and the maintenance of personal efficiency and mental health. Intended for Lower Division students in all schools of the College. (5 F, W or S)

Staff

71. Experimental Methods in Psychology. A study of the scientific method and of specific experimental procedures applied in the study of fundamental problems in psychology. Prerequisite: General Psychology. (3W)

Sharp

80. Study Habits. A practical course, highly individualized, designed to aid students in improving the efficiency of their work and study habits. Individual appointments arranged for one-third of the time. (3F, W or S)

Egbert

102. Educational Psychology. A professional course for prospective high school teachers intended to increase understanding of adolescents and to develop greater insight into the conditions for effective learning. **Applications to development in adolescence** of both normal and deviate personalities, to provisions for individual differences, and to learning junior and senior high school subjects are emphasized. Prerequisite: General Psychology. (5F, W or S)

Stone & Egbert

105. Child Psychology. The roles of maturation, learning, and environmental conditions in the motor, mental, social, and emotional **development in children from birth to adolescence.** Generalizations with respect to dynamics of personality, individual differences, emotions, motivation, how children learn, observe, and think are applied to understanding and guiding children's behavior in home, school, and community. Opportunity for observation and applications of psychological methods of child study in the school is provided. Prerequisite: General Psychology. (3F, W & S)

Frandsen

108. Educational Psychology for Elementary School Teachers. A study, from the point of view of psychological theory and research, of the aims, selection and sequence of content, methods of teaching, provisions for individual differences, and measurement of outcomes in the elementary school curriculum. Tool subjects are emphasized. Prerequisite: General Psychology. (2F, W & S)

Frandsen

112. Applications of Statistics to Education and Psychology. An elementary study of the statistical procedures used in handling test scores in the schools and of the concepts needed to read current educational and psychological literature. May be taken by last quarter sophomores who have taken General Psychology. (3F or S)

Frandsen

114-214. Independent Readings in Psychology. For students who cannot participate in the discussions in Psychology 115, this course provides an opportunity for independent readings and conferences on topics elected by the student. (2F, W or S)

Staff

115-215. Seminar: Readings and Discussions on Current and Special Topics in Psychology. Weekly discussions of topics in current magazines plus independent reading either of some especially significant book or of periodical literature on some specialized topic, selected according to each student's interest. Two credits each quarter. May be taken 1, 2, or 3 quarters. (2 F, W or S)

Frandsen, Stone or Sharp

121. Individual Differences. The nature, extent, and causes of human differences and of the implications and applications of a recognition of these differences in several major life activities. Besides students majoring in psychology, the concepts of human differences should find useful applications in the study and work of students majoring in the other social and biological sciences—sociology, political science, economics, education, medicine, public health, and genetics. (3S)

Sharp

123 or 223. Psychology of Exceptional Children. The development and behavior characteristics of exceptional children and of the education, home management, social control, and psychological treatment especially suited to their needs. The groups included are the mentally deficient, physically handicapped, the gifted, and children with serious personality and conduct problems. (3W or Su.)

Sharp or Frandsen

127. Psychology of Learning. A comprehensive study of descriptions of learning, factors related to efficiency, explanatory theories of learning, and of applications of the facts and explanatory principles to guiding learning in school and out-of-school situations. Prerequisite: General Psychology. (3S)

Frandsen or Sharp

140. Abnormal Psychology. A descriptive and explanatory study of the varieties of mental abnormality—psychoses, psychoneuroses, and minor maladjustments—their causes, the methods of treatment and the mental hygiene approach in preventing psychological maladjustments. Prerequisite: General Psychology. (3S)

Sharp

145. Mental Hygiene. Common personal and social adjustment problems of normal people. The course shows how people, in striving to attain a balanced satisfaction of motives in their major life activities, learn different modes of adjustment: effective patterns of behavior, a variety of maladjustive mechanisms, and non-adjustive reactions. It should aid in cultivating personal efficiency and mental health and increase understanding of the human problems dealt with by parents, teachers, social workers, and personnel workers. Prerequisite: General Psychology. (3W)

Sharp

155. Psychology of Business and Industry. Methods and explanatory principles of psychology are applied to understanding several general problems of business and industry, including vocational choice and the selection of employees; advertising and selling; marketing and consumer research; conditions for efficient work, and the psychological aspects of training for work in business and industry. (See also Business Administration 155). Prerequisite: General Psychology or instructor's approval. (3F)

Stone

161. Social Psychology. A study of the acquisition of personality or "self." The effect of society on the individual, and the individual's reciprocal effect on society is considered in terms of such topics as propaganda, institutional behavior, "social" neuroses, morale, leadership, membership, etc. Prerequisite: General Psychology. (3W)

Stone

175 or 275. Physiological Psychology. Physiological mechanisms underlying normal and abnormal behavior, with special attention to those operating in both organic and non-organic disturbances. Prerequisite: General Psychology. ()

Sharp

181 or 281. Clinical Psychology: Psychometrics Applied to Guidance, Adjustment Problems, and Remedial Teaching. For school counselors, personnel workers, social workers, and clinical psychologists. Consideration is given selection, evaluation, administration, interpretation, and practical uses of tests of intelligence, aptitudes, interests, personality and quality of personal and social adjustment. Prerequisites: General Psychology and Elementary Statistics. For seniors or graduate students. (F5)

Frandsen

182 or 282. Clinical Psychology: Individual Diagnostic Intelligence Testing. The theory and techniques of individual diagnostic intelligence testing, including practice in the administration of (a) the Stanford-Binet and other individual tests especially suited to psychological examination of children and (b) the Wechsler-Bellevue and related tests for use with adolescents and adults. How to interpret test data so they will yield significant information on level of general ability, differential abilities, work methods, and on personality and adjustment are studied. (5W)

Frandsen

183 or 283. Clinical Psychology: Theory and Practice of Counseling and Psychotherapy. In educational and vocational guidance, in improving school achievement and worker efficiency, and in treating problems of personal and social maladjustments, the uses of the following procedures are studied: Non-directive counseling; directed problem-solving interviewing; giving advice, assurance, persuasion, and information; play therapy; and use of controlled family, school, club or camp, community, and institutional environments. Prerequisite: General Psychology. (3S)

Frandsen

188 or 288. Practicum in Clinical Psychology. Arrangements are made for obtaining experience under staff supervision in vocational guidance; diagnostic testing and writing of interpretative reports; counseling; psychotherapy; diagnos-

tic and remedial teaching. Subjects will include children, adolescents, and adults in schools, institutions for the feeble-minded and for delinquents, and in mental hospitals. The psychological procedures and the institution will be selected according to the qualifications and interests of each student. Time and credit to be arranged. (F, W or S) **Staff**

191. History and Systems of Psychology. A survey of the history of psychology and a critical comparison of the several systematic points of view on major problems in psychology. Alternates with 231. () **Stone**

202. Advanced Educational Psychology. The contributions of modern theory and recent research to the following fundamental problems of teaching and guidance are studied: motivation; learning; improvement of study habits; uses of tests in guidance and in measurement of achievement; social psychology of childhood and adolescence; personality and conduct problems; and mental health. Problems for master's degree thesis are indicated. Prerequisite: Ed. Psych. (3Su.) **Frandsen or Stone**

212. Treatment of Psychometric Results. Statistical methods of representation, and analysis of interrelationships of psychological test scores. (2W) **Frandsen**

216. Research on Special Problems in Psychology. Credit and time arranged with the approval of a member of the Department of Psychology. (F, W or S) **Staff**

217. Research for Master's Thesis in Psychology. Credit and time arranged with the approval of a member of the Department of Psychology. (F, W, or S) **Frandsen, Stone, Sharp, Egbert**

231. Advanced Psychology of Meaning. A seminar course for graduate students. Analysis of the physiological and socio-psychological bases of meaning, and the classification of "sign behavior." Alternates with 191. (3Su.) **Stone**

285. Projective Methods for the Study of Personality. The dynamics of human adjustment and the common projective methods for revealing motives, attitudes, and adjustment mechanisms in individual personalities. (5S) **Frandsen**

284. Hospital Treatment of Mental Patients. Seminar and staff conferences on personality appraisals, diagnoses, and treatment of mental hospital patients. Students will observe and will participate in treatment to the extent they are qualified in all of the hospital routines and "treatment" activities in which patients participate. (4F, W or S) **Staff**

286. Problem in Counseling and Clinical Psychology. Individual case studies of children and adolescents presenting problems of diagnosis, guidance, remedial teaching, and psychotherapy will be studied. (2F) **Frandsen**

287. Occupational Information. Collection, Classification and Uses in Counseling of Occupational Information. (2W) **Stone**

SCHOOL OF ENGINEERING AND TECHNOLOGY

J. E. Christiansen, Dean

General Information	190
Division of Engineering	191
Agricultural Engineering	191
Civil Engineering	194
Irrigation and Drainage	198
Division of Technology	200
Aeronautics	201
Air Conditioning and Refrigeration	204
Automotive Technology	207
Ground School Courses	208
Industrial Education	210
Industrial Arts	211
Trade and Industrial Education	212
Photography	215
Metalwork and Mechanical Drawing	216
Machine Tool Technology	216
Mechanical Drawing	218
Forge Practice	219
Welding	220
Radio and Electronics	222
Woodwork and Building Construction	224

General Information

THE School of Engineering and Technology consists of the Division of Engineering and the Division of Technology.

The Civil and Agricultural Engineering curricula were established in 1888 when the College was founded. Automotive, Metals, and Woodwork and Building Construction were also established in 1888, but under the name of Mechanic Arts. Degree work in Radio was established in 1929. Degree work in Aeronautics was established in 1940, and in Air Conditioning and Refrigeration, and Welding in 1947. The name of the School was changed from the School of Engineering, Industries and Trades to its present name in 1947.

Division of Engineering. The Division of Engineering offers both under-graduate and graduate work leading to Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering. Both of these curricula include courses and majors in Irrigation and Drainage.

Division of Technology. The Division of Technology offers four-year curricula leading to the Bachelor of Science degree in Industrial Technology, Radio and Electronics, and Industrial Education. Majors are offered in Aeronautics, Air Conditioning and Refrigeration, Automotive, Machine Tool Technology, Photography, Radio and Electronics, Welding, and Woodwork and Building Construction. Graduate work is offered in Industrial Education. These degree curricula are designed to train skilled technicians, supervisors, managers, plant operators, shop and garage foremen, and teachers of Industrial Arts, and Trades and Industries. They combine training in vocational skills, applied science, and general education.

Technical short courses are offered in Aircraft and Engine Mechanics, Air Conditioning and Refrigeration, Automotive Repair, Auto Body Reconditioning, Carpentry, Diesel Repair, Machine Shop Practice, Photography, and Welding. These short courses are designed to meet the needs of those who do not desire a degree, but who wish to learn a skilled trade, and at the same time have an opportunity to benefit from general college courses and to enjoy college life.

Admission. For general requirements see the Academic Regulations in the catalog introduction. For entrance in the Division of Engineering, students must have taken in high school, Advanced Algebra and Solid Geometry, or the equivalent, or must complete, without credit toward graduation, Math. 33 and 34.

Scholarship. All students must maintain an average grade of C or better to remain in College and be eligible for graduation. The faculty reserves the right to accept toward graduation only credits with a grade of C or better. In the Division of Engineering, it is important that students make a C grade or better in all Mathematics taken during the Freshman and Sophomore years. Students who fail to do this usually have difficulty with upper division engineering courses.

Graduation. Candidates for graduation must satisfy the general college requirements as listed in the Academic Regulations, with the exception of those pertaining to group requirements. They must, in addition, satisfy the requirements of the prescribed curriculum of their elected major.

Opportunity for Graduates. The tremendous development in modern industry, the necessity for control and development of natural resources, the rapid advance of transportation and communication, and the development of structures to meet the needs of society, give assurance that future graduates of the School of Engineering and Technology will have ample opportunity for professional employment of an interesting and remunerative character.

Faculty Advisors Personal contact with the student is provided through a system of advisors who assist the student when registering, and who are available for consultation at all times.

Personnel Service. The School of Engineering and Technology, through its faculty, establishes definite contacts with those industries, corporations, municipal, state, and federal agencies that employ technically trained men. Employment assistance is given to members of each graduating class, to alumni who desire to change positions, and to undergraduates who wish summer employment.

DIVISION OF ENGINEERING

The Division of Engineering offers both undergraduate and graduate work leading to the Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering. The courses offered by the department of Irrigation and Drainage, constitute an important part of both curricula, and a major option for those wishing to specialize in this field. Many of the leaders in the field of irrigation and drainage are graduates of Utah State Agricultural College.

Objectives. The objectives of the four-year curricula in Engineering are to provide the student an opportunity to secure the thorough, fundamental, and technical education which is necessary for professional work of the highest grade, and to insure the development of those physical, mental, moral, and social qualities which are essential to high professional attainment.

Upper Division Standing. A student must have completed a total of 96 credits, including Chemistry 10 and 11, Physics 20, 21, 22, and Mathematics 99, or its equivalent, before he is admitted to upper division standing in engineering, and is eligible to take C.E. 101 and C.E. 141.

Engineering Societies. General professional association and advancement are promoted by the activities of the student branches of the national engineering societies, of which the following are represented, either by faculty membership or student chapters, or both: American Society of Civil Engineers, American Society of Agricultural Engineers, American Road Builders' Association, Highway Research Board, American Concrete Institute, American Society for Engineering Education, and American Geographical Union.

Summer Surveying Camp. During the summer session following the Sophomore year, a surveying camp is held where plane, topographical, and route surveying are taught. Completion of Summer Surveying Camp is required of all engineering students. Students taking this course must be immunized against Rocky Mountain Spotted Fever.

Engineering Seminars. Engineering seminars are a feature of the advanced engineering work. Courses 198 and 199 are required of all engineering students during the Senior year.

Field Trips. Field trips to local construction projects, engineering works, and industries are arranged for engineering students. All seniors in engineering are required to take a supervised field trip covering the major engineering works in the western United States. This trip is usually scheduled during the Spring Quarter.

Agricultural Engineering

J. E. Christiansen, O. W. Israelson, C. H. Milligan, Joseph Coulam, Professors; A. Alvin Bishop, Associate Professor; Spencer H. Daines, B. L. Embry, Assistant Professors; J. Donald Wadsworth, Instructor; Day L. Bassett, Collaborator.

For nearly a century in America, those agricultural problems that have demanded the help of engineers have been solved by civil, mechanical, and electrical engineers. During the last quarter century, the need and value of engineering services in agriculture have grown so rapidly and widely as to demand the development of a major field of engineering designated as Agricultural Engineering.

The Department of Agricultural Engineering offers instruction in courses involving the application of engineering knowledge to the solution of farm problems. The most important of these problems are in the fields of farm machinery, farm motors, rural electrification, farm buildings, farm sanitary equipment, soil erosion control, irrigation, and drainage.

A four-year curriculum leading to a Bachelor of Science Degree in Agricultural Engineering is offered. This curriculum includes mathematics, arts and sciences, fundamental subjects in the different engineering departments, agricultural courses selected to familiarize the student with modern agriculture, and a thorough treatment of the Agricultural Engineering courses.

Graduates from the curriculum have opportunity to work in the following fields: (a) The manufacture and development of farm machinery and equipment; (b) irrigation, drainage, and soil conservation; (c) rural electrification; (d) design and construction of farm buildings; (e) teaching, research, and extension in colleges, experiment stations, and in the United States Department of Agriculture; (f) agricultural engineering for farm papers and technical magazines; (g) selling and maintenance of farm equipment; and (h) management of large farms.

Students majoring in Agricultural Engineering should be well versed in farm practices and have a real interest in the agricultural industry.

The Agricultural Engineering Department has available for its use approximately 6,500 square feet of laboratory space. The farm power and machinery laboratory is equipped to service, overhaul, and maintain farm machinery. The facilities of the irrigation and drainage laboratories are ample to conduct both research and class exercises in all their various divisions. These laboratories are housed in the Engineering and Agricultural Engineering Buildings.

A major in Agricultural Mechanics is available to students registering in the School of Agriculture.

AGRICULTURAL ENGINEERING CURRICULUM

Degree: Bachelor of Science in Agricultural Engineering

Freshman				Sophomore					
Course	F	W	S	Course	F	W	S	Su	
C.E. 1, 2, 3	1	1	1	C.E. 84, 82, 85, 87	3	3	3	7	
C.E. 61, 62, 63	2	2	3	Math. 98, 99	5	5	—		
Chem. 10, 11	5	5	—	Zoology 1	—	—	5		
I.D. 12	—	—	4	Phys. 20, 21, 22	5	5	5		
Eng. 17, 18, 19	3	3	3	Agron. 56	—	—	4		
Math. 35, 46, 97*	5	5	5	Econ. 51	—	5	—		
Shop **	2	2	2	Speech 5	3	—	—		
M.S. 1, 2, 3	1	1	1	C.E. 65	1	—	—		
	19	19	19	M.S. 4, 5, 6	1	1	1		
					18	19	18	7	

Junior				Senior			
Course	F	W	S	Course	F	W	S
C.E. 101, 102, 103	4	4	4	C.E. 108, 109, 110	1	1	1
A.E. 107, 110	—	4	2	A.E. 106, 116	3	3	—
C.E. 197, 196, 173	4	4	4	I.D. 146	—	3	—
B.A. 109	3	—	—	I.D. 148	—	—	3
C.E. 192	—	3	—	C.E. 105, 106	6	6	—
Geol. 3	—	—	5	Ag. Econ. 106	—	—	5
Pol. Sci. 20, 181	3	2	—	A.E. 115, 109, 108	4	3	4
A. H. 1	—	—	3	A.E. 198, 199	—	2	2
Agron. 107	5	—	—	English 111	4	—	—
	19	17	18		18	18	15

Courses

4. Dairy Mechanics. A study of the basic equipment found in modern dairy plants; their accessories and upkeep. Three lectures, one lab. (4F) **Daines**

14. Farm Power for Agricultural Students. The principles, operation, care and maintenance of internal combustion engines and electric motors. Prerequisite: Math. 34. Two lectures, one lab. (3F or S) **Daines**

*Students deficient in high school mathematics, Algebra (b) and Solid Geometry, must register for Math. 34 and 33 during the Freshman year. Math. 33 and 34 do not count credit toward graduation in Engineering.

**Shop includes Metalwork, Woodwork, and Welding. All three courses are offered each quarter.

15. Farm Machinery for Agricultural Students. Principles of mechanics and materials as applied to farm machinery. The operation, adjustment, and care of the various types of agricultural machines. Prerequisite: Math. 34 or equivalent. Two lectures, one lab. (3W or S) **Embry**

105. Farm Woodwork and Building for Agricultural Students. Location, planning and construction of farm buildings. Wood and metal preservations, fences, and fencing and the farm workshop. Three lectures, two labs. (5F or S) **Coulam**

106. Farm Structures. Economics of farm buildings; insulation as it involves heating and ventilating; mechanics of farm buildings; types of construction; building materials; location and planning of the farmstead; fundamental requirements and design of farm buildings common to Western agriculture. Prerequisite: C.E. 101. Three lectures. (3F) **Coulam**

107. Irrigation Hydraulics. Principles of hydraulics that apply particularly to irrigation engineering. Special emphasis is given to flow of water in pipes and open channels, and water measurement. Prerequisite: Math. 99, Physics 20. Three lectures, one laboratory. (4W) **Staff**

108. Engineering Aspects of Soil and Water Conservation. Extent and kinds of erosion, rate of water absorption, soil erodibility, soil vegetation and cultural practices. Erosion control structures, surveys for hydraulic design of terraces, terrace outlets and soil-saving dams. Tillage and farming methods, strip-cropping, erosion and alkali problems on irrigated land. Three lectures, one lab. (4S) **Bishop**

109. Farm Utilities. Modern methods of heating, lighting, ventilating, water supply, and farm-sanitation; and farm electrical systems and appliances. Three lectures. Prerequisite: C.E. 101. (3W) **Daines**

110. Pumps and Pumping. Selection and installation of pumping equipment, theory of pumps, power schedules and cost of pumping. Prerequisite: A.E. 107. Two lectures. (2S) **Staff**

111. Mechanisms in Farm Machinery. A study of mechanical methods of transmitting motion of farm machines, including cams, gears, universal joints, etc. Prerequisite: C.E. 101. Two lectures, one lab. (3F) (Will not be taught in 1950-51) **Daines**

113. Farm Machinery Repair. Applied problems in farm machinery repair and maintenance. Prerequisite: Forging 81a and Welding 96, or equivalent. Three labs. (3F or S) **Wadsworth**

115. Farm Implements. Selections, operation, adjustment and care of the various types of agricultural machines. Prerequisite: C.E. 101. Three lectures, one lab. (4F) **Embry**

116. Farm Tractors. A study of design, operation, and performance of the farm tractor. Efficiencies and ratings as determined by the Nebraska Tractor Tests. Prerequisite: C.E. 101. Two lectures, one lab. (3W) (Will not be taught in 1950-51) **Daines**

117. Farm Machinery Design. Fundamentals of farm machinery design including draft requirements of farm implements. Selection of metals, stress analysis, layout and construction of farm machines. A.E. 111 prerequisite. (5S) **Daines**

198, 199. Engineering Seminar and Conferences. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all seniors. Two credits each quarter. Two lectures. (2W, 2S) **Christiansen**

230. Special Problems in Agricultural Engineering. Independent study of chosen problems in agricultural engineering, given under the direction of a member of the department staff. The student is expected to develop his own initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or Graduate standing. Any quarter. Time and credit arranged. **Staff**

298. Thesis. Time and credit arranged. (F, W or S) **Staff**

Civil Engineering

J. E. Christiansen, O. W. Israelsen, H. R. Kepner, C. H. Milligan, E. M. Stock, Professors; A. Alvin Bishop, Associate Professor; Spencer H. Daines, B. L. Embry, Willis A. Tingey, Reynold K. Watkins, Assistant Professors; Edward A. Dionne, Instructor.

Civil Engineering consists of the economic application of the laws, forces, and materials of nature to the design and construction of engineering structures, including irrigation and drainage systems, highways, railways, bridges, buildings, dams, water supply systems, hydro-electric plants, and many other works which are a part of the requirements of civilization today.

The curriculum in Civil Engineering has been carefully planned, and is accredited by the Engineers' Council for Professional Development. It is based upon a thorough training in English, mathematics, physics and chemistry, combined with drawing, surveying, mechanics, hydraulics, and economics. Upon this substructure is built a superstructure consisting of the applications of these subjects to the many phases of Civil Engineering. Special emphasis is placed upon work in Irrigation and Drainage.

A Summer Surveying Camp is required and academic work is supplemented by local field trips during the Junior year, and a major field trip of approximately one week duration, during the Senior year. These field trips provide opportunity for first hand study of projects under investigation, construction and after completion. All field trips are carefully planned and are carried out under the joint direction of the faculty and representatives of the work being inspected.

An analysis of the status of the Civil Engineering graduate from Utah State Agricultural College shows that approximately 80 percent are in federal, state, city, or county positions, and about 20 percent in private practice, or working for private corporations. Finding employment for graduates has not been a problem at this institution.

The Engineering departments are housed in the Engineering Building, where well equipped laboratories and classrooms provide ample facilities for the work in engineering. The irrigation and hydraulics laboratories are equipped with pumps, turbines, water measuring devices, pipe lines, and models of hydraulic structures. A model hydraulic laboratory demonstration unit is available for instruction and laboratory use. The soil mechanics laboratory is equipped with the latest machines and instruments for determining the engineering properties of soil. The laboratories are equipped for testing both metallic and non-metallic materials. Standard testing equipment for determining the physical properties of timber, metals, clay products, concrete and bituminous materials are available. The structural laboratories are equipped for demonstration and investigation of statically indeterminate structures, using Begg's method and the Photo-elastic Polariscope.

CIVIL ENGINEERING CURRICULA

Degree: Bachelor of Science in Civil Engineering

Freshman					Sophomore				
Course	F	W	S	Su	Course	F	W	S	Su
C.E. 1, 2	1	1	0		C.E. 82, 84, 85, 87	3	3	3	7
C.E. 61, 62, 63	2	2	3		Math. 98, 99, 122	5	5	3	
Chem. 10, 11, (12) ¹	5	5	(5)		Physics 20, 21, 22	5	5	5	
I.D. 12 ²	—	—	4		Geology 3	—	—	5	
English 17, 18, 19	3	3	3		Economics 51	—	5	—	
Math. 35, 46, 97 ³	5	5	5		Speech 5	3	—	—	
Shop ⁴	2	2	2		C.E. 65	1	or (1)		
M.S. 1, 2, 3	1	1	1		M.S. 4, 5, 6	1	1	1	
	19	19	19(20)			18	19	17(18)7	

1—Required of students taking Sanitary Engineering Option.

2—Not required of students taking Sanitary Engineering Option.

3—Students deficient in high school mathematics, Algebra (b) and Solid Geometry, must register for Math. 33 and 34 during the Freshman year. Math 33 and 34 do not count credit toward graduation in Engineering.

4—Shop includes Metalwork, Woodwork, and Welding. All three courses are offered each quarter.

Junior				Senior			
Course	F	W	S	Course	F	W	S
C.E. 101, 102, 103	4	4	4	C.E. 105, 106, 107	6	6	5
C.E. 141, 142, 143 or (130) ⁵	4	4	4 (3)	C.E. 108, 109, 110	1	1	1
C.E. 120, 196, 197	3	4	4	C.E. 150, 190, 182	4	3	2
B.A. 109, C.E. 192, 173	3	3	4	C.E. 198, 199	—	2	2
Pol. Sci. 20, 181 ⁶	3	2	—	English 111	4	—	—
Geol. 103 or C.E. 181 ⁶	—	—	3	Options ⁶	3	6	7
	17	17	19(18)		18	18	17

Senior Options

Highways				Irrigation and Drainage			
Course	F	W	S	Course	F	W	S
C.E. 124, 125, 127	3	3	3	I.D. 149, 160, 147	3	3	3
C.E. 193 or I.D. 146	—	3	—	I.D. 146, 145	—	3	4
C.E. 194 or I.D. 145	—	—	4		18	18	17
	18	18	17				
Structural				Sanitary			
Course	F	W	S	Course	F	W	S
C.E. 130 or Elective	3	—	—	Bact. 70	4	—	—
C.E. 131, 132	—	3	3	Bact. 140	—	3	—
C.E. 193 or I.D. 146	—	4	—	P.H. 144 or 50	—	—	3
C.E. 194 or I.D. 145	—	—	4	C.E. 193 and 194	—	3	4
	18	18	17		19	18	17

Courses

1. 2. Engineering Orientation. A preview of engineering; including what engineering is, what engineers do, what aptitudes are essential to success, and philosophy of engineering education. One lecture each week. Required of all Freshman Engineering students. (1F, W) **Christiansen**

59. Blue Print Reading and Industrial Drawing. Primarily for majors in Business Administration. The reading and interpretation of blue prints, use of instruments, lettering, and elementary drawing, including construction of graphs, flow charts, etc. Three labs. (3W) **Staff**

60. Elementary Drawing. Primarily for Forestry students. The use of instruments, simple lettering, and drawing. One lab. (1F or W) **Tingey**

61. Engineering Drawing. Use of instruments, lettering, applied geometry, orthographic projection, and technical sketching. Two labs. (2F or W) **Dionne**

62. Advanced Engineering Drawing. Pictorial representation, conventional representation, dimensioning, working drawings, and lettering. Prerequisite: C.E. 61. Two labs. (2W or S) **Dionne**

63. Descriptive Geometry. Principal and auxiliary views; points, lines, and planes; developments, intersections, and warped surfaces; mining problems. Prerequisites: C.E. 61, Mech. Draw. 91, or L.A. 20. One lecture, two labs. (3S) **Dionne**

65. Engineering Problems. Practical engineering problems solved by the use of algebra and trigonometry. Methods of computations include the use of logarithms, slide-rule, and calculating machines. Special emphasis is placed upon the development of good habits of work and study. Prerequisite: Math. 46. One lab. (1F or S) **Tingey**

80. Office Practice (For Foresters). Practice in preparing office plans from surveys that are encountered by the forester in working up field notes. Prerequisite: C.E. 81 or equivalent. Two labs, one lecture. (3W) **Tingey**

⁵—Highway and Structural majors may substitute C.E. 130 for 143.

⁶—Not required of students taking Advanced Military. Advanced Military may also be substituted for one option course each quarter in the senior year.

81. Plane Surveying. Primarily for Forestry and Radio Students. Use of tape, hand level, level, transit, compass, etc. Differential and profile leveling, traversing, plotting, mapping, and care of engineering instruments. Prerequisites: Math. 35 and 46. One lecture, two labs. (3F or S) **Tingey**

82. Mapping and Office Practice. Practice in mapping of the various kinds of surveys that may be encountered by the engineer in working up field notes. Prerequisite: C.E. 81 or 84. One lecture, two labs. (3W) **Stock**

84. Elements of Surveying. For engineers. Theory of surveying. Terminology, computations, areas, volumes, field astronomy, and general surveying. Prerequisites: Math. 35 and 46. Two lectures, one lab. (3F) **Stock**

85. Advanced Surveying. For Engineers. Problems in chaining, leveling curves, spirals, stadia, plane table surveying, and city surveying. Prerequisites: C.E. 82 and 84. Two lectures, one lab. (3S) **Stock**

87. Summer Surveying Camp. Surveying office and field practice in camp. Topographic, land, route, and geodetic surveying. Actual field surveys are made. Students pay their own transportation and living expenses and the regular summer quarter registration fee. Immunization against Rocky Mountain Spotted Fever required for the course. Prerequisite: C.E. 85 or equivalent. Daily, eight hours a day, for six weeks. (7Su) **Stock**

101, 102, 103. Engineering Mechanics. Includes statics, dynamics, and strength of materials. The Fall Quarter and part of the Winter Quarter are devoted to the study of resultants and equilibrium of force systems, friction, center of gravity, moment of inertia, and the kinematics and kinetics of bodies in translation, rotation, and plane motion. The remainder of the year is devoted to the study of properties of engineering materials, stress and strain in tension and compression members, shafts, beams, and columns, combined and principal stresses, fatigue, impact, and energy loads and special topics. Prerequisite: Math. 99. Three lectures, one lab. (4F, 4W, 4S) **Watkins**

105, 106, 107. Structural Theory and Design. The sequence introduces the student to the analysis and design of structural frameworks and their elements; C.E. 105 in steel and timber; C.E. 106 in reinforced concrete. In C.E. 107 students are given more comprehensive problems in the design of buildings and bridges, involving the use of principles already studied and including design computations and structural drawing practice. Prerequisites: Engineering Mechanics, CE. 101, 102, 103. Fall and Winter Quarters, lecture daily, one lab; Spring Quarter, 3 lectures and 2 labs. (6F, 6W, 5S) **Kepner**

108, 109, 110. Materials Testing Laboratory. Strength, composition, and physical properties of engineering materials, including wood, concrete, metal and bituminous. One lab. (1F, 1W, 1S) **Watkins**

120. Roads and Pavements. Elements of highway engineering. Types of roads and pavements, methods of construction and maintenance, jurisprudence, and finance. Prerequisite: C.E. 87. Three lectures. (3F) **Stock**

124. Street and Highway Traffic Control. Collection and analysis of traffic data; causes and remedies for traffic congestion and accidents; traffic control devices; illumination of streets and highways; economics and administration of traffic control. Prerequisite: C.E. 120. Three lectures, one lab. (3F) **Stock**

125. Highway Design. Theory and practice in the design of rural highways. Preparation of highway plans and profiles, mass diagrams, right-of-way surveys, and drainage features. Prerequisite: C.E. 120. Two lectures, one lab. (3W) **Stock**

127. City Planning. Master plans, civic units, parks and playgrounds, utilities, housing, sub-divisions, zoning, civic centers and airports. Three lectures. (3S) **Stock**

130. Building Construction and Cost Estimating. Construction methods used in fabrication and erection of buildings and practice in estimating costs. Three lectures. (3F, S) **Kepner**

131, 132. Structural Design Problems. Advanced analysis and design of statically determinate and indeterminate structures. For students desiring to specialize in the structural field. Prerequisite: C.E. 105. Three lectures. (3W, 3S) **Kepner**

141, 142, 143. Fluid Mechanics and Hydraulics. Properties of fluids, the principles of hydrostatics, flow of ideal and real fluids, principles of similarity, the

flow of fluids in pipes and open channels, measurement of fluid flow and hydraulic principles underlying the design and selection of tangential and reaction turbines and pumps. Prerequisites: Physics 20, Math. 99. Two lectures, two labs. (4F, W, S) **Milligan**

150. Soil Mechanics. Elementary physics of soil as applied to engineering problems. Moisture, plasticity, and capillary relationships. Percolation and seepage, shear, stress distribution, consolidation and stability as factors in the design of earth structures and foundations. Prerequisites: Math. 122, C.E. 103, 142. Three lectures, one lab. (4F) **Watkins**

171. Hydrology. (Primarily for Forestry Students). Weather elements, factors influencing run-off, and influence of range and land-management practices on run-off and erosion. Three lectures. (3F) **Staff**

173. Hydrology and Meteorology. The hydrologic cycle, including weather elements and climate, precipitation, evaporation, transpiration, infiltration, groundwater, and runoff methods of collection of hydrologic data and its use in water supply and flood control studies. Prerequisites: C.E. 142, or by special arrangement. Three lectures, one lab. (4S) **Milligan**

176. Application of Thermodynamics. For Air Conditioning, Aeronautics, and Automotive majors. The applications of the laws of thermodynamics to combustion engines, compressors, vapor cycles, and refrigeration are studied. Prerequisites: Math. 35, 44; Physics 22. 3 lectures. (3S) **Dionne**

181. Photogrammetry. The science or art of utilizing photographs of the earth's surface for making surveys, maps, and land utilization studies. Planimetric maps, mosaics and restituted photographs, their construction and uses. Prerequisites: C.E. 63, 81, or 85, or senior standing in Forestry, Range, or Wildlife Management, Geology, Landscape Architecture, Aeronautics, or Advanced Military Science. Two lectures, one lab. (3S) **Tingey**

182. Route Surveying. Theory and practice in highway curves and earth work, including method used in highway, street, canal, pipe line and general project surveys. One lecture, one lab. (2S) **Stock**

190. Contracts and Specifications. Synopsis of the law of contracts. Prerequisite: Senior standing. Three lectures. (3W) **Bishop**

192. Engineering Economy. Financial and cost problems associated with engineering design, operation and construction. The determination of the economic alternative in engineering. Prerequisites: B.A. 100, Econ. 51. Three lectures. (3W) **Watkins**

193. Municipal Water Systems. Elements of design, construction, and maintenance of waterworks systems. Treatment of public water supplies. Prerequisite: C.E. 142. Three lectures. (3W) **Stock**

194. Sewerage. Principles of design, construction and maintenance of sewer systems. Treatment of sewage by physical, chemical, and biological action and methods of final disposal. Prerequisites: C.E. 142 and Bact. 70. Three lectures, one lab. (4S) **Stock**

195. Sanitary Design. Principles of design, construction, and maintenance of water purification plants and sewage treatment plants. Problems involving both functional as well as structural design features are included. Prerequisites: C.E. 193, 194. Three lectures, one lab. (4S) **Stock**

196. Elementary Engineering Thermodynamics. The general energy equations, principles of the thermodynamic cycles for internal combustion engines, processes of vapors, air compression, refrigeration, and flow of fluids. Prerequisites: Physics 22 and Math. 99. Three lectures, one lab. (4W or S) **Dionne**

197. Electrical Machinery. Theory and performance of electrical machinery. Power transmission and distribution. Applications of electrical machinery. Prerequisites: Physics 21 and Math. 99. Three lectures, one lab. (4F, W or S) **Embry**

198, 199. Engineering, Seminar and Conferences. Discussion of engineering subjects. Provides opportunity for both oral and written expression. Talks by visiting engineers. Required of all seniors. Two lectures. (2W, S) **Christiansen**

201, 202. Advanced Structural Theory. Advanced mechanics of materials, including photo-elastic analysis. Classical and modern theories of indeterminate structure analysis, including model analysis. Theory of limit design. Prerequisite: C.E. 132. Three lectures. (3F, or W) **Kepner**

203. Advanced Structural Design. Design of modern indeterminate structures. Student selects suitable structure for design and proceeds from preliminary planning stage to complete detailing. Prerequisite: C.E. 132. Any quarter. (3)

Kepner

210. Earth and Rock-Fill Dams. Design of flexible type (earth or rock-fill) dams, utilizing naturally available materials. The theories of soil mechanics are used to check designs against criteria for structural stability and stability against seepage. Special attention is given to foundations and construction details. For graduate students and specially prepared seniors. (3F) **Milligan**

211. Masonry Dams. Design of rigid type dams. Stress analysis and design of gravity, gravity-arch, single arch, multiple arch, and deck types of masonry dams. Timber, steel, and other miscellaneous types are also considered. For graduate students and specially prepared seniors. Time arranged. (3W) **Milligan**

212. Appurtenances to Dams, and Operation of Reservoirs. Hydraulic and structural design of tunnels, gates, outlet channels, trash racks, etc. Operation of reservoirs for flood control and irrigation use. For graduate students and specially prepared seniors. (3S) **Milligan**

215. Hydro-Electric Design. Selection of plant capacity from hydrological information. Effect of storage on capacity. Economic height of dams. Selection of equipment. Layout and arrangement of power plants. For graduate students and specially prepared seniors. Prerequisite: C.E. 143. Time arranged. (3S)

Milligan

220, 221, 222. Advanced Highway Engineering. Economics of location and design; selection, improvement, and maintenance; traffic control, administration, finance and jurisdiction as applied to highways. Prerequisite: C.E. 125. (3F, W, S) **Stock**

230. Special Problems in Civil Engineering. Independent study of chosen problems in civil engineering, given under the direction of a member of the department staff. The student is expected to develop his own initiative in pursuing these problems. Standard formal typewritten reports are required. Prerequisite: Senior or graduate standing. Any quarter. Time and credit arranged. **Staff**

241, 242. Advanced Fluid Mechanics and Hydraulics. Effects of pressure, inertia, gravity, viscosity, compressibility, and surface tension on the motion of fluids. Surface resistance, form resistance, and lift and propulsion. Dynamic similarity. Non-uniform flow in open channels. Prerequisites: C.E. 142 and 196, or equivalents. (3F, W) **Milligan**

243. Advanced Hydraulic Design. Design of pipe lines, special flumes, spillways, water control structures, and hydraulic machinery. Prerequisites: I.D. 147, C.E. 143, and Math. 122. (3S) **Milligan**

250. Advanced Soil Mechanics. Theories of seepage, capillarity, stress, consolidation, and stability are developed and applied to the practical design and construction of earth structures. Interpretation of laboratory tests is given special attention. For graduate students and specially prepared seniors. Prerequisites: Math. 122 and C.E. 150, or its equivalent. (3S) **Milligan**

251. Advanced Soil Mechanics Laboratory. Advanced laboratory work in soil mechanics. (1S) **Milligan**

298. Graduate Thesis. Time and credit arranged. Each quarter. **Staff**

299. Graduate Seminar. Time arranged. (1S) **Staff**

Irrigation and Drainage

J. E. Christiansen, C. H. Milligan, O. W. Israelsen, Professors; A. Alvin Bishop, Associate Professor; Vaughn Hansen, Assistant Research Professor; George D. Clyde, J. H. Maughan, C. W. Lauritzen, Willis Barrett, Gregory L. Pearson, Warren Rasmussen, Collaborators, U. S. Department of Agriculture.

Both undergraduate and graduate work leading to Bachelor of Science and Master of Science degrees in Agricultural Engineering and Civil Engineering, with majors in Irrigation and Drainage, are offered by this department.

The Department also carries on a program of research in collaboration with the Soil Conservation Service and the Bureau of Plant Industry, Soils and Agricultural Engineering, of the U. S. Department of Agriculture, under the direc-

tion of the Agricultural Experiment Station. This provides opportunities for qualified students to act as part-time research assistants, and in so doing, to obtain experience and compensation for their services.

Utah State Agricultural College is located in the heart of the irrigated regions of the West. Emphasis is placed upon basic principles of engineering applicable to the design, construction, operation and maintenance of irrigation systems, and upon the solution of problems related to irrigation agriculture.

A joint major in Irrigation and Soils is available for students registering in the School of Agriculture.

IRRIGATION AND DRAINAGE COURSES

10. Irrigation for Agricultural Students. The principles and practices underlying efficient and economic use of water in irrigation, including land preparation, water measurement, irrigation methods, irrigation efficiencies, and simple structures, for the control of measurement of water. Three lectures, one lab. (4F or S) **Bishop**

12. Irrigation Practice. Sources and conveyance of irrigation water, from pumping plants, water measurements, preparation of land for irrigation, soil properties and plant characteristics in relation to irrigation, alkali, duty of water, and irrigation efficiencies. Three lectures, one lab. (4F or S) **Bishop**

112. Irrigation Principles. Especially for advanced students in Agriculture or Engineering, who have not taken I.D. 10 or 12. Principles of irrigation, including soil, water and plant relations, irrigation methods, irrigation efficiencies, salinity, etc. (3W) **Israelsen or Bishop**

145. Design of Drainage Systems. Drainage design in relation to soil properties, location of drains, flow into tile, properties of tile, drainage construction. Prerequisites: I.D. 12 and C.E. 142. Two lectures, one lab. (3S) **Israelsen**

146. Design of Water Conveyance Irrigation Structures. Application of the principles of solid, fluid, and soil mechanics, to the solution of engineering designs for earth canals, lined canals, flumes, transitions, and pipe lines. Prerequisites: C.E. 106, 142, and 150. Two lectures, one lab. (3W) **Bishop**

147. Design of Water Control Irrigation Structures. Design of dams, diversion works, drops and chutes, spillways, wasteways, headgates, and check gates. Prerequisite: I.D. 146. Three lectures. (3S) **Milligan, Bishop**

148. Design of Farm Irrigation Systems. Application of engineering principles to the planning and design of farm irrigation systems. Includes open ditch and pipe line distribution systems, for application of water by both surface and sprinkling methods. Prerequisites: I.D. 146. (3S) (May not be offered 1950-51.) **Staff**

149. Irrigation Institutions. Laws governing the acquirement, adjudication, and administration of water rights; state water codes, mutual companies, commercial companies, irrigation and drainage districts; Federal legislation affecting water. Three lectures. (3F) **Bishop**

160. Management of Irrigation Systems. Details of staff organization for irrigation systems. Distribution of water to irrigators. Financing for construction and operation. Maintenance of canals, flumes, pipe lines, dams, weirs, and other irrigation structures. Prerequisite: I.D. 149. (3W) **Bishop**

212, 213. Problems in Irrigation Agriculture. Advanced work on the major problems in agriculture under irrigation, including management of irrigation projects, consolidation of irrigation companies, formation of soil conservation districts, irrigation efficiencies, erosion control, irrigation and the alkali problem. Instruction in residence or in absentia. Time arranged. Credit according to work done. Each quarter. **Staff**

241. Research in Irrigation and Drainage. The regular research activities of irrigation and drainage staff members afford excellent opportunities for direction of student research projects. A qualified student may elect a problem in any phase of irrigation or drainage in civil engineering for study at the College or elsewhere. Results in research may be used in part to meet the requirements for an advanced degree. This course is for research other than that for thesis. Research for graduate thesis is covered by I.D. 298 or C.E. 298. Credit according to work done. Each quarter. Time arranged **Staff**

245. Advanced Design of Drainage Systems. Modern drainage systems with special reference to depths and spacing of gravity drains in relation to soil permeabilities, sources and quantities of excess water; also gravity drains and pumping ground water for drainage, leaching and reclamation of saline and alkali soils. (3S) **Israelsen**

249. Advanced Irrigation Institutions and Management. Problems in laws governing the acquirement and adjudication of water rights, and in the distribution of water, according to established rights; the improvement of irrigation and drainage enterprises; and operation problems. Instruction in residence or in absentia. Each quarter. Time arranged. Credit according to work done. **Milligan**

298. Graduate Thesis. Time and credit arranged. Each quarter.

Staff

DIVISION OF TECHNOLOGY

The Division of Technology is one of the two divisions in the School of Engineering and Technology. It is composed of seven departments, namely: Aeronautics, Air Conditioning and Refrigeration, Automotive, Industrial Education, Metalwork and Mechanical Drawing, Radio and Electronics, and Woodwork and Building Construction.

Beginning as a Department of Mechanic Arts in 1888, this work has expanded and developed into the present Division of Technology with seven separate Departments. This growth is a result of efforts of this Institution to provide for the "liberal and practical education of the industrial classes" as outlined in the original charter for Land-Grant Colleges and Universities.

This Division, in an attempt to better meet the needs of the students, offers three major programs:

I. Industrial Technology Program. Present day industry requires the services of engineers, technicians, and skilled craftsmen. The Industrial Technology Program is a four-year technical program leading to the degree of Bachelor of Science in Industrial Technology (or Radio and Electronics). The training provided combines technical knowledge and manual skills with a broad general college education. This program is designed to prepare technicians for technical, supervisory or managerial positions in several fields of modern industry and is an excellent foundation for entrance into industrial Civil Service positions, or for private business. The prescribed curricula under this program are described under the departments in which they are offered.

II. Industrial Education Program. This program, offered by the Department of Industrial Education, is for the professional training of teachers, supervisors, and administrators in Industrial Education positions. Courses are offered during the regular school year and the Summer Session. Completion of the undergraduate curriculum leads to the degree of Bachelor of Science in Industrial Education with majors in Industrial Arts Education for Junior and Senior High School positions, and Trade and Industrial Education for Junior College and Vocational School positions.

Graduate work leading to the degree of Master of Science in Industrial Education is also offered.

III. Vocational Technical Program. This program is designed to prepare skilled technicians for modern industry. Completion of the two-year curricula, listed under the departments in which they are offered, leads to a Certificate of Completion in the specific field. This program is briefer, and of a more specialized nature than the degree program.

This program is offered in close cooperation with the State Department of Public Instruction, and with industry. Problems of training and placing of students are considered jointly with advisory committees representing the trade. The instruction covers the practices of industry with emphasis on latest methods, modern equipment, and live productive work. The instructors are men with years of successful trade experience in their field.

The Vocational Technical Program offers many distinct advantages to students desiring terminal education. Students completing this program are not only well prepared with the skills of their trade to enter modern industry, but they

are also prepared, through their association and activities on a college campus, to take their place in society. Students entering industry from this training program have opportunities for further progress and advancement in industry, as has been demonstrated by many industrial leaders. By returning to this Institution for further training, qualified students may apply most of the credit earned under this program toward a degree, and thus better prepare themselves for supervisory and managerial positions.

The Division of Technology, as an integral part of a Land-Grant College of Agriculture and Mechanic Arts, is pioneering in this field in its desire to provide the types of training specified in the Morrell Act of 1862, establishing the Land-Grant Colleges.

Aeronautics

H. A. Buntine, Assistant Professor; **Lowell P. Summers**,
Louis Klein, Jr., Instructors.

This department offers instruction for the thorough training of skilled aircraft and aircraft engine mechanics and aeronautical technicians.

The Aeronautics Department is a fully certificated Air Agency complying with Civil Aeronautics Authority Regulations, and holds Certificate No. 1175 covering training of combined aircraft and aircraft engine mechanics. The curricula, equipment, and instructors have been properly certificated in compliance with regulations for the training of aircraft and aircraft engine mechanics.

Satisfactory completion of the two-year curriculum qualifies graduates to apply for both Civil Aeronautics Administration Aircraft and Aircraft Engine Mechanic Ratings. This training prepares graduates for both aircraft and aircraft engine maintenance, and manufacturing employment. The degree curriculum combines a thorough technical training in Aeronautics with a general college education. Training is based upon the objective of scientifically and systematically developing students to a point where they can assume responsible positions in the industry. Students graduating in four-year curriculum are required to have successfully accomplished the written and practical C.A.A. examinations for Aircraft and Aircraft Engine Mechanic Ratings.

Facilities include a new building with complete laboratories and modern equipment for instruction in aircraft engine, propellers and accessories, aircraft construction, and maintenance and repair, including hydraulic systems and instruments.

The department is equipped with the latest type aircraft, engines and related units necessary for training in these fields. Also included are electro-plating, sandblast, magneto and carburetor testing equipment. Training in the aircraft laboratories is supplemented by courses in the Machine Shop, Sheet Metal, Welding and Woodwork offered by the separate departments.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Aeronautics

Freshman

Course	F	W	S
Aero 5, 6, 7	5	5	5
Aero 55, 56, 57	5	5	5
Math. 34, 35, 44	3	5	3
Welding 92, 93	—	3	3
Radio 21	4	—	—
M.S. 1, 2, 3	1	1	1
Electives	—	—	—
	18	19	17

Sophomore

Course	F	W	S
Aero 8, 9, 10	5	5	5
Aero 58, 59, 60	5	5	5
English 17, 18, 19	3	3	3
MTT 51b	—	3	—
M.D. 91, 92, 93	2	2	2
M.S. 4, 5, 6	1	1	1
Electives	2	—	2
	18	19	18

Junior				Senior			
Course	F	W	S	Course	F	W	S
Aero 100, 104, 105	3	3	3	Aero 101, 132, 126	3	3	2
Physics 20, 22	5	—	5	Aero 37, 131	3	2	—
Chemistry 10, 11	5	5	—	Econ. 125	3	—	—
C.E. 63	3	—	—	Bus. Adm. 147, 148, 100	3	3	3
M.D. 95, 198	—	3	3	English 111 or 112	—	—	4
Zoology 111	—	4	—	Aero 133	2	—	—
Electives	—	—	5	MTT 150	3	—	—
	16	15	16	C.E. 176	—	—	3
				Electives	—	7	3
					17	15	15

Two-Year Vocational Technical Program
Certificate of Completion in Aircraft and Engine Mechanics

First Year				Second Year			
Course	F	W	S	Course	F	W	S
Aero 5, 6, 7	5	5	5	Aero 8, 9, 10	5	5	5
Aero 55, 56, 57	5	5	5	Aero 58, 59, 60	5	5	5
W.W. 6	3	—	—	Engl. 17, 18, 19	3	3	3
Radio 21	4	—	—	MTT 51b	—	3	—
Welding 92, 93	—	3	3	M.D. 91, 92	2	2	—
M. S. & T.	1	1	1	Ind. Ed. 21	—	—	3
Electives	—	4	4	M. S. & T.	1	1	1
	18	18	18	Electives	2	—	—
					18	19	17

Description of Courses

5. 55. Composite Aircraft Structures. (Technical and Shop) Design, construction, repair and maintenance of composite aircraft, including wood structures, fabric work and finishing, control systems, landing gear, engine mounts, and pertinent Civil Air Regulations. Basic related instruction includes airfoils, types of aircraft, aircraft structures, parts and fittings, design factors, methods of fabrication, materials and processes and stress analysis. (Tech. 5; Shop 5; F)

Klein

6. 56. All-Metal Aircraft Structures. (Technical and Shop) Design, construction, repair and maintenance of all-metal aircraft, including layout, template and flat plate development, bend allowance, hand forming, riveting procedure, special tool construction, power press and power shear operation, heat treatment, corrosion prevention, and pertinent Civil Air Regulations. The adaptation of stressed skin aircraft construction; a study of strength, weight and use of aluminum alloys, design factors; methods of fabrication; fittings, forgings, and extrusions; monocoque, and semi-monocoque structures; stress analysis; materials and processes. (Tech. 5; Shop 5; W)

Klein

7. 57. Aircraft Maintenance. (Technical and Shop) The maintenance, repair and alteration of modern aircraft and miscellaneous related equipment, including aircraft hydraulics, instruments, electrical equipment and installation and general servicing of components; rigging, weight and balance computations, periodic inspections, recording of repairs and alterations, time and material cost estimates, material and equipment requirements. Pertinent Civil Air Regulations are included. (Tech. 5; Shop 5; S)

Klein

8. 58. Aircraft Powerplants. (Technical and Shop) Repair, maintenance, and operation of modern air cooled and liquid cooled aircraft engines, including design, disassembly and reassembly procedures, special tools and their application, power sections, accessory sections, supercharged sections, cylinder and valve mechanisms, and pertinent Civil Air Regulations. Basic related material includes a study of specifications and tolerances, horsepower curves, M.E.P., B.M.E.P., B.H.P., design factors, inspection methods, materials and processes, volumetric efficiency, and compression ratios. (Tech. 5; Shop 5; F)

Summers

9, 59. Aircraft Powerplant Accessories. (Technical and Shop) Operation, repair and maintenance of modern aircraft engine accessories, including design, fuel systems, carburetion and carburetors, fuel injection systems, lubricating systems, magnetos, generators and voltage control systems, batteries and starters, and fuel pumps. Application and compliance with pertinent Civil Air Regulations. Basic related material includes combustion and combustible mixtures, electricity and magnetism, induction systems and superchargers, fuels and lubricants. (Tech. 5; Shop 5; W) **Summers**

10, 60. Aircraft Powerplant Maintenance. (Technical and Shop) Training in the repair and alteration, maintenance, and operation of modern aircraft powerplants, including periodic inspections, maintenance servicing, diagnosis of engine malfunctioning; engine installation, test and servicing; installation and maintenance of propellers, hydromatic, constant speed, controllable and wood; use of special tools; major and minor engine repair and alteration; time and materials costs; and pertinent Civil Air Regulations. (Tech. 5; Shop 5; S) **Summers**

100. Fundamentals of Turbo-Jet Propulsion. History, development and general principles of jet propulsion. Thrust and performance, combustion systems, metallurgy, American, British and foreign gas turbines; aerodynamic problems; application. Prerequisite: 10, 10a. Three lectures. (3F) **Buntine**

101. Advanced Engine Operation and Performance. Principles underlying relationships between altitude, power output, and fuel consumption of aircraft engines. Torque stand testing, fuel and octane rating studies. Analysis and summarizing of test data. Three lectures. (3F) **Summers**

104. Advanced Aircraft Design and Construction. Latest methods in current use for design and manufacturing of stressed skin aircraft. Correlation of design requirements and manufacture. Pertinent Civil Aeronautics Administration Regulations covering design. Three lectures. (3W) **Buntine**

105. Aircraft Woods and Plastics. Analysis of woods and plastics as applied to aircraft. Emphasis is placed on investigation and development of methods involving design criteria, applications of elastic theory, and effects upon structural analysis. Two lectures. (2S) **Klein**

126. Airline Maintenance and Fixed Base Operations. Administrative problems of airline and airport management; unit organization; personnel problems; relationships with Civil Aeronautics Administration; interline agreements; promotion and publicity. Two lectures. (2W) **Buntine**

130. Aeronautics Seminar. Current topics in production methods, cost, design, supply and organization of interest to aeronautical technicians. (2S) **Buntine**

131. Time and Motion Study. Techniques of time and motion study and their inter-relationships. Detailed discussion and practice with process charts, multiple-activity charts, micromotion study. Therblig check lists, motion economy and stop watch time study. Methods of application and personnel problems involved. Two lectures. (2W) **Klein**

132. Airport Planning. The airport and the community. Present and future aircraft. Airway and Airport Traffic Control. Airport types, Fundamental airport requirements. Airfield planning. Airfield construction. Lighting. Building design. Hangar design. Special services. Special problems and miscellaneous facilities. Three lectures. (3S) **Buntine**

133. Certificated Repair Station Operation. Operation of an approved C.A.A. Repair Station. Two lectures. (2F) **Klein**

GROUND SCHOOL COURSES

31. Civil Air Regulations, Radio and Airway Procedures. Rules and regulations pertaining to operation of aircraft, radio, and airway procedures. Two lectures. (2F, W or S) **Summers**

32. General Service and Operation of Aircraft. Aeronautical Ground School (Primary). Theory of flight, inspection, care and maintenance of aircraft and engines. Two lectures. (2F, W or S) **Klein**

33. Meteorology. Weather, maps, atmosphere, air masses, clouds and weather reports. Required by C.A.A. for any pilot rating above private. Three lectures. (3F, W or S) **Buntine**

34. Navigation. Maps, charts and other navigational problems. Required by the C.A.A. for any pilot rating above private. Three lectures. (3F, W or S)

Buntine

135. Aeronautical Ground School (Advanced). Intensive course in aircraft, aircraft engines, propellers, construction, inspection, and general maintenance. Prerequisite: Aero 32. Five lectures. (5W)

Buntine

FLIGHT COURSES

37. Private Pilot Certificate. Flight school Primary. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for satisfactory completion. Prerequisites: Aero 31 and 32. (3F, W or S)

Staff

137. Commercial Pilot Certificate. Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for certification. Prerequisites: Aero 31, 32, 33, 34, or Private Pilot Certificate and Aero 33, 34. (10F, W or S)

Staff

138. Flight Instructor Certificate. Flight School (advanced). Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for certificate. Prerequisite: Aero 137. (2F, W or S)

Staff

139. Instrument Rating. Flight School (advanced). Flight training to meet C.A.A. requirements. Satisfactory completion of C.A.A. tests required for completion. Prerequisite: Aero 137. (2F, W or S)

Staff

Air Conditioning and Refrigeration

J. C. Sharp, Assistant Professor; **A. Q. Woodruff,** , Instructors.

This department prepares skilled technicians in air conditioning and refrigeration and allied fields, including: (1) winter heating of small commercial buildings and homes; (2) sheetmetal work; and (3) domestic appliances.

The courses are arranged to meet the needs of the industry and the requirements of the various national societies interested in air conditioning and refrigeration. A chapter of the Refrigeration Service Engineers Society (an international organization) is established on the campus and majors in this department are afforded the opportunity to join this society.

New, large air conditioning and refrigeration laboratories contain excellent equipment for the thorough study of domestic and commercial refrigeration, air conditioning, and sheet metal work. They are equipped with the newer type test instruments, and tools for the practical and complete testing of all equipment in these fields.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Air Conditioning and Refrigeration

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
AC&R 1, 2, 11	6	6	6	AC&R 12, 21, 22	6	6	6
Math. 34, 35, 44	3	5	3	Physics 6, 7	—	5	5
Chemistry 10, 11	—	5	5	Mech. Drg. 91, 92, CE 63	2	2	3
Radio 21	4	—	—	English 17, 18, 19	3	3	3
Electives	3	—	3	MS&T	1	1	1
MS&T	1	1	1	Electives	5	—	—
	17	17	18		17	17	18

Junior				Senior			
Course	F	W	S	Course	F	W	S
AC&R 151, 152, 162	4	4	4	AC&R 111, 141, 121	4	4	4
AC&R 161, 122, 123	3	3	3	AC&R 172, 112, 194	3	3	3
Econ. 51	5	—	—	BA 147, 148	—	3	3
Bact. 1 & 2	—	5	—	English 111, or 112	4	—	—
Dairy 101	—	—	5	MTT 51b	—	3	—
CE 176	—	—	3	Welding 91	3	—	—
BA 109	3	—	—	CE 130, 190	3	3	—
AC&R 61	—	3	—	Electives	—	—	6
Electives	3	3	3		—	—	—
	18	18	18		17	16	16

NOTE: For those desiring a minor in Industrial Education or who desire to meet the course requirements for a State Teacher's Certificate, the necessary Industrial Education courses may be substituted for certain related courses in the above curriculum; providing the proposed courses are approved by the departments of Industrial Education and Air Conditioning and Refrigeration.

Two-Year Vocational Technical Program
Certificate of Completion in Air Conditioning and Refrigeration

First Year				Second Year			
Course	F	W	S	Course	F	W	S
AC&R 1, 2, 11	6	6	6	AC&R 12, 21, 22	6	6	6
*AC&R 31, 32, 33	4	4	4	†AC&R 34, 41, 42	4	4	4
WW 6	3	—	—	English 17, 18, 19	3	3	3
Radio 21, MD 91, 92	4	2	2	AC&R 61, Ind. Ed. 21	—	3	3
MS&T	1	1	1	MS&T	1	1	1
Electives	—	3	3	Electives	3	—	—
	18	16	16		17	17	17

*Offered in 1950-51

†Offered in 1951-52

Description of Courses

1. Basic Refrigeration. Construction and operation of refrigeration units. The units include compression cycles, compressors, automatic controls, refrigerants and accessories used in refrigeration systems. Fundamental for all students in refrigeration. 3 lectures, 3 labs. (6F) Staff

2. Domestic Refrigeration. Continuation of AC&R 1. Component parts are assembled and operated in various domestic boxes. Includes electric motors, hermetic units, absorption cycles, servicing and repair of domestic refrigerators. Prerequisite: AC&R 1. 3 lectures, 3 labs. (6W) Staff

7. Principles of Refrigeration. Principles and practices in construction, operation, and servicing of modern refrigerators and home freezer equipment. Includes motors, compressors, freezing units, temperature controls, and cabinets. Open to all college students. (Taught with AC&R 1 lecture.) 3 lectures. (3F) Staff

11. Commercial Refrigeration, Single Systems. Construction, operation, servicing and repair of single system commercial refrigerators. Includes commercial boxes, commercial compressors, condensers, evaporators, pressure reducing devices, and controls. Emphasizes the calculation and selection of proper size units so that a complete commercial refrigeration system will operate correctly. Commercial refrigerators are studied and tested in actual operation in relation to capacity, efficiency, and operating characteristics. Prerequisite: AC&R 2. 3 lectures, 3 labs. (6S) Staff

12. Commercial Refrigeration, Multiple Unit. Construction, operation, servicing and repair of multiple type commercial refrigerators. Includes commercial low side floats, two-temperature valves, electric solenoids, two position and modu-

lating shut-off valves. Temprite valves, pressure controls, and carbonators. Heat pumps are assembled and tested. Multiple units are assembled, run and tested for the various service problems encountered in commercial servicing of high, medium, and low temperature work. Prerequisite: AC&R 11. 3 lectures, 3 labs. (6F)

Woodruff

21. Air Conditioning, Domestic Types. Design, construction, operation, servicing, and repair of domestic air conditioning instruments and equipment. Includes sling psychrometers, psychrometric charts, humidstats, thermostats, evaporative coolers, unit air-conditioners, filters, gauges, hygrometers, and anemometers. 3 lectures, 3 labs. (6W)

Woodruff

22. Air Conditioning, Commercial Types. Design, construction, operation, servicing, and repair of commercial air conditioning equipment. Includes air conditioning compressors, evaporators, duct work, air conditioning controls, pilot tubes, decibel meters, psychological aids, and comfort charts. A typical commercial air conditioning unit is assembled and used for analysis and correction of operational difficulties encountered in this type of equipment. Prerequisites: AC&R 21 and 61. 3 lectures, 3 labs. (6S)

Woodruff

31. Refrigeration Tools and Copper Tubing. Types, construction, and proper use of hand tools used in refrigeration service work. Bending and soldering of hard and soft drawn copper tubing. 2 lectures, 2 labs. (4F)

Woodruff

32. Refrigeration Motors. Construction, operation, servicing and repair of electric motors used in refrigeration installations. Prerequisites: RA 21. 2 lectures, 2 labs. (4W)

Woodruff

33. Thermostatic Expansion Valves. Construction, operation, servicing and repair of thermostatic expansion valves. Prerequisites: AC&R 1 and 2. 2 lectures, 2 labs. (4S)

Staff

34. Design of Commercial Refrigeration Units. A study of the problems of selecting refrigeration components in designing small commercial refrigeration units. Actual problems will be assigned for solution. Experiments in the lab will be used to test the results of these problems. 2 lectures, 2 labs. (4F) (Not offered 1950-51)

Staff

41. Fans and Blowers for Air Conditioning. Construction, operation, servicing and repair of fans and blowers used in air conditioning work. Shop tests to acquaint students with fan and blower operation are made. 2 lectures, 2 labs. (4W) (Not offered 1950-51)

Woodruff

42. Duct Work. Design, construction, and testing of representative field conditions for various size ducts used in air conditioning work will be studied. 2 lectures, 2 labs. (4S) (Not offered 1950-51)

Woodruff

61. Sheet Metal Work. Principles and practices in the use of the sheet metal tools, equipment, and materials; forming, fabrication, and layout techniques as related to the air conditioning industry and the building trades. Prerequisites: Mech. Drg. 92. 2 lectures, 1 lab. (3W)

Staff

111. Low Temperature Refrigeration. Advanced training in the principles, construction, operation and repair of low temperature refrigeration equipment. Prerequisites: AC&R 12. 2 lectures, 2 labs. (4F)

Sharp

112. Advanced Commercial Refrigeration. Advanced technical training in the design and testing of commercial and industrial refrigerating units. Special emphasis is placed on refrigerating cycles, heat transfer problems, nomographs for refrigerants, methods of testing the complete refrigerant plant, food freezing problems, etc. 3 lectures. (3W)

Staff

121. Industrial Air Conditioning. Advanced technical training in the principles, construction, operation and repair of industrial air conditioning equipment. Prerequisite: AC&R 22. 2 lectures, 2 labs. (4S)

Staff

122. Winter Air Conditioning. Advanced technical training in the principles, design, construction, operation, and repair of the various heating and humidification systems used in winter air conditioning. Prerequisites: AC&R 22. 3 lectures. (3W)

Woodruff

123. Economics of Air Conditioning. An economic study of the factors entering into the design, construction and operating of various types of air conditioning. Prerequisites: Econ. 51, AC&R 122 and 161. 3 lectures. (3S)

Sharp

141. Design of Air Conditioning Systems. Advanced technical training in design of air conditioning systems. Prerequisites: CE 63, AC&R 123, 2 lectures, 2 labs. (4W) **Sharp**

151. Electric Motors. Advanced technical training in the principles, construction, operation and repair of the motors used in air conditioning and refrigeration equipment. Prerequisite: RA 21. 2 lectures, 2 labs. (4F) **Staff**

152. Air Conditioning Electric Circuits. Advanced technical training in the principles, construction, operation and repair of the electric circuits used in air conditioning and refrigeration. Prerequisite: RA 21. 2 lectures, 2 labs. (4W) **Staff**

161. Stokers and Oil Burners. Technical training in the principles, construction, operation and repair of the modern coal stokers and oil burners. Prerequisite: AC&R 22. 3 lectures. (3F) **Sharp**

162. Instrument Technology. Technical training in the principles, operation and repair of pressure and temperature instruments. 2 lectures, 2 labs. (4S) **Staff**

172. Problems in Heat Transfer. Application of the laws of heat transfer to refrigeration and air conditioning problems. Prerequisite: CE 176. 3 lectures. (3F) **Sharp**

191, 192, 193. Advanced Laboratory Work. Advanced laboratory work in the construction, testing, and repair of specialized air conditioning and refrigeration equipment. For senior students majoring in Air Conditioning and Refrigeration. Prerequisite: Engl. 111. 1 lecture, 2 labs. (3F, W or S) **Staff**

194. Seminar. Current topics in production methods, cost design, supply and organization of interest to Air Conditioning and Refrigeration majors. (3S) **Staff**

Automotive Technology

Edward L. France, Assistant Professor; Clyde Hurst, Owen Slaugh, Lynn Willey, Vern R. Beecher, Instructors.

This department offers instruction in Automotive and Diesel Technology, Automotive and Diesel Mechanics, and Auto Body Reconditioning. It also provides general service courses for students in other departments who desire to become familiar with the various phases of the automotive field.

Training facilities include a new building designed and built specifically for automotive and aircraft instruction. The laboratories contain the latest and most modern servicing equipment and are excellently lighted and ventilated to provide ideal conditions for study in this type of work.

A Bachelor of Science degree in Industrial Technology is offered with majors in Automotive or Diesel. A major in these fields prepares a student as a technician who can better interpret the designs of the engineer and direct the work of the repairman. This major also prepares students to become shop foremen, shop superintendents and with special preparation, school instructors. These curricula provide excellent foundations for entrance into civil service, private business and managerial positions with large companies.

A certificate of completion is offered in Automotive or Diesel Mechanics and Auto Body Reconditioning for students who desire intensive short term training to prepare them as skilled mechanics.

Students wishing to better prepare themselves for advanced or graduate study at other institutions in Automotive, Diesel or closely allied fields of engineering may do so by substituting mathematics and engineering courses during their junior and senior years.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Automotive Technology

Freshman			
Course	F	W	S
Auto 1, 2, 3	10	10	10
Math. 34, 35, 44	3	5	3
Mech. Dwg. 91, 92	—	2	2
MTT 51b	3	—	—
M.S. 1, 2, 3	1	1	1
Electives	—	—	2
	17	18	18

Sophomore			
Course	F	W	S
Auto 4, 5, 6	10	10	10
English 17, 18, 19	3	3	3
Radio 21	4	—	—
Econ. 51	—	5	—
Welding 91	—	—	3
M.S. 4, 5, 6	1	1	1
	18	19	17

Junior			
Course	F	W	S
Welding 190	—	3	—
Auto 162	—	3	—
C.E. 65, 176	1	—	3
Physics 20, 21, 22	5	5	5
Chemistry 1	5	—	—
B.A. 109	—	3	—
MTT 150	3	—	—
English 112	—	—	4
Electives	3	3	4
	17	17	16

Senior			
Course	F	W	S
Auto 151, 152, 154	3	3	3
Zoology 111	—	4	—
Econ. 125	3	—	—
B.A. 147, 148	3	3	—
I.E. 113	—	—	3
I.E. 120	—	—	3
Electives	6	5	6
	15	15	15

Certificate of Completion in Auto Body Reconditioning

First Year:			
	F	W	S
Auto 12, 13, 16	10	10	10
W.W. 6 or Math. 34	3	—	—
Welding 91, 94	3	3	—
Forge Practice 81b	—	—	3
Electives	—	3	3
M.S. 1, 2, 3	1	1	1
	17	17	17

Second Year:			
	F	W	S
Auto 11, 14, 15	10	10	10
English 17, 18, 19	3	3	3
Mech. Dwg. 91, 92	2	2	—
I.E. 21	—	—	3
Electives	2	2	—
M.S. 4, 5, 6	1	1	1
	18	18	17

Certificate of Completion in Automotive Repair

First Year:			
	F	W	S
Auto 1, 2, 3	10	10	10
W.W. 6 or Math. 34	3	—	—
Metalwork 51b	3	—	—
Welding 91, Radio 21	—	3	4
Electives	—	3	2
M.S. 1, 2, 3	1	1	1
	17	17	17

Second Year:			
	F	W	S
Auto 4, 5, 6	10	10	10
English 17, 18, 19	3	3	3
Mech. Dwg. 91, 92	2	2	—
I.E. 21	—	—	3
Electives	2	2	—
M.S. 4, 5, 6	1	1	1
	18	18	17

Certificate of Completion in Diesel and Heavy Duty Mechanics

First Year:			
	F	W	S
Auto 21, 22, 23	10	10	10
W.W. 6 or Math. 34	3	—	—
Metalwork 51b	3	—	—
Welding 91, Radio 21	—	3	4
Electives	—	3	2
M.S. 1, 2, 3	1	1	1
	17	17	17

Second Year:			
	F	W	S
Auto 4, 5, 6	10	10	10
English 17, 18, 19	3	3	3
Mech. Dwg. 91, 92	2	2	—
I.E. 21	—	—	3
Electives	2	2	—
M.S. 4, 5, 6	1	1	1
	18	18	17

1. Steering Correction. (Technical and Shop.) The construction, operation, and repair of the parts of the automobile chassis. The units covered are axles, wheels, control linkage, wheel suspension, steering gears, wheel alignment, wheel balancing, frame straightening, and brakes. Modern methods of repair. (Tech. 5; Shop 5; F) **Beecher**

2. Automotive Engines. (Technical and Shop.) The construction, operation, and repair of the modern automobile engine, including cylinder blocks, piston assemblies, crankshaft assemblies, valve assemblies, cooling and lubricating systems. Modern methods of repair. (Tech. 6; Shop 5; W) **Beecher**

3. Driving Mechanisms. (Technical and Shop.) The construction, operation, and repair of clutches, transmissions, overdrives, universals, drive shafts, differentials, and rear axles. Modern methods of repair. (Tech. 5; Shop 5; S) **Beecher**

4. Fuel Systems. (Technical and Shop.) The construction, operation and repair of gasoline tanks, fuel systems, carburetors, manifolds, controls, and special devices such as superchargers, governors, and auto diesel engine fuel systems. Modern methods of repair. (Tech. 5; Shop 5; F) **France and Slaugh**

5. Auto Electrics. (Technical and Shop.) The construction, operation and repair of the electric systems used on modern automotive equipment, including the battery, lighting systems, ignition systems, starting and generating systems. Modern methods of repair. (Tech. 5; Shop 5; W) **France and Slaugh**

6. Motor Tune-Up. (Technical and Shop.) Correlates the work covered on engines, carburetion and electrics. Tests for troubles are made with modern tune-up equipment and these troubles remedied by trade-accepted methods. (Tech. 5; Shop 5; S) **France and Slaugh**

11. Chassis Alignment. (Technical and Shop.) The repair and alignment of chassis frames, front and rear axles, wheels, and steering mechanisms. Latest methods are stressed in the checking and correcting of damaged automobile chassis units. (Tech. 5; Shop 5; F) **Slaugh**

12. Fender Reconditioning. (Technical and Shop.) Roughing out, shrinking, leading, buffing, sanding, and metal finishing of fenders. General use of the spray gun in applying primer surfaces. (Tech. 5; Shop 5; F) **Willey**

13. Body Reconditioning. (Technical and Shop.) The construction and repair of automobile bodies. Units include the checking and alignment of automobile bodies and the repair and replacement of damaged body panels, such as the dash, cowl, trunk, rocker, floor, side, top and door panels. (Tech. 5; Shop 5; W) **Willey**

14. Body Mechanisms. (Technical and Shop.) The repair and replacement of modern automobile body mechanisms, including mechanical, electrical, and hydraulic regulating devices, windshield wipers, body wiring, and lights. (Tech. 5; Shop 5; S) **Hurst**

15. Auto Trimming and Upholstering. (Technical and Shop.) The repair, cleaning, dyeing and replacement of all auto body upholstery. Units covered are floor coverings, headlinings, door and quarter trim pads, windlace and trim mouldings, seat cushions, and sewing machine operation. (Tech. 5; Shop 5; W) **Willey**

16. Automotive Refinishing. (Technical and Shop.) The preparation of body metal and the application of lacquer and synthetic enamels, including metal preparation, priming, surfacing and the application of color. Practice in spotting, striping, and graining. (Tech. 5; Shop 5; S) **Willey**

21. Heavy Duty Chassis. (Technical and Shop.) The construction, operation and repair of automotive diesel and heavy duty chassis. The units covered are heavy duty axles, wheels, control linkage, wheel suspensions, steering gears, wheel alignment, frame straightening, and brakes. (Tech. 5; Shop 5; F) **Hurst**

22. Automotive Diesel Engines. (Technical and Shop.) The construction, operation and repair of automotive diesel engines, including two-stroke cycle and four-stroke automotive, truck and tractor engines together with their accessories. (Tech. 5; Shop 5; W) **Hurst**

23. Heavy Duty Drives. (Technical and Shop.) The construction, operation and maintenance of driving mechanisms powered by automotive diesel and other heavy duty engines. (Tech. 5; Shop 5; S) **Hurst**

51. Automobile Chassis. Principles and practice in the construction, operation, and servicing of the modern automobile chassis. The units of the course include axle, wheel suspension, steering gears, frames, springs, universals, drive shafts and brake. Open to any college student. Two lectures, two 2-hr. labs. (3F)

Hurst

52. Automobile Power Plants. Principles and practice in the construction, operation and servicing of the modern automobile power plant. Units of the course include cylinder block assemblies, piston assemblies, crankshaft assemblies, valve assemblies, clutches, transmission, overdrive, fuel, cooling and lubrication systems. Open to any college student. Two lectures, two 2-hr. labs. (3F, W or S)

Slaugh

53. Automobile Electricity. Principles and practice in the construction, operation, and servicing of the electrical systems used on the modern automobile. The units to be covered include starting, generating, lighting, ignition, and special accessory systems. Two lectures, two 2-hr. labs. (3S)

France

61. Body and Fender Repair. Principles and practice in the fundamentals of fender and body repairing, including work in metal finishing, light welding, door and body alignment. Open to any college student. Two lectures, two 2-hr. labs. (3F)

Willey

62. Upholstering. Principles and practice in the repair of modern upholstery. Rebuilding and recovering of automobile upholstery and home furniture. A practical course in upholstery repair. Open to any college student. Two lectures, two 2-hr. labs. (3W)

Willey

151. Carburetion. Advanced technical training in fuels and carburetion as applied to the modern automobile, including fuel pumps, carburetors, manifolds and controls. Also principles of combustion, compression and exhaust gas analysis. Prerequisite: Auto 52 or equivalent. Two lectures, two 2-hr. labs. (3F)

France

152. Motors, Generators and Magnetos. Advanced technical training in the construction, operation and repair of the starting motor, generator, magneto, and their controlling devices. Prerequisite: Auto 53 or equivalent. Two lectures, two 2-hr. labs. (3W)

France

154. Seminar and Special Problems. A systematic review of the automotive field with discussions and reports on recent developments. Laboratory analysis of special problems encountered in automotive work. Prerequisite: Auto 151 and 152. Two lectures, two 2-hr. labs. (3S)

France

162. Metal Refinishing. Principles and practice in preparing of metal for refinishing. Fundamental procedures in priming, surfacing, and applying of lacquer and enamel. Two lectures, two 2-hr. labs. (3S)

Willey

Industrial Education

Ernest C. Jeppsen,* William E. Mortimer, Professors; **C. D. McBride, Edward L. France,** Assistant Professors; **Bert V. Allen, Vern R. Beecher, Chas. W. Hailes, Fred R. Pryor,** Instructors.

This department offers professional training for teachers, supervisors, and administrative staff in Industrial Education. Students completing their undergraduate work receive a Bachelor of Science degree in Industrial Education, with a major in Industrial Arts Education or Trade and Industrial Education.

The Master of Science degree is offered in Industrial Education with majors in Industrial Arts Education or Trade and Industrial Education. The following courses in the 100 series may be used for graduate credit by majors in Industrial Education and by majors in closely related departments: I.E. 102, 104, 107, 109, 110, 111, 120, 121, 123, 124, 154, 167. Courses in the 200 series are intended for graduate work. Registration in these courses requires the approval of the major professor and the instructor concerned.

INDUSTRIAL ARTS

The curriculum in Industrial Arts is designed to meet state certification requirements for the General Secondary and Class A Industrial Arts certificate and is composed of courses in Arts and Sciences, Education, Industrial Arts Technical and Professional, and basic shop skills. The catalog description of each course in the curriculum will be found in the description of courses for each department offering the various courses.

It is recommended that students use part of the elective hours shown in the curriculum to take the following courses: Math. 44, Physics 20, 21, 22, and Chemistry 10 and 11. If these courses are taken, Physics 31 and 32 should not be taken.

CURRICULUM

Degree: Bachelor of Science in Industrial Education
Major: Industrial Arts Education

Freshman			
Course	F	W	S
Art 1, 2	—	3	3
Botany 1	5	—	—
Econ. 51	—	—	5
Math. 35	—	5	—
Mech. Dwg. 91, 92, 93	2	2	2
Metalwork 51	—	—	5
Woodwork 61, 62	5	5	—
M.S. 1, 2, 3	1	1	1
Electives†	3	—	—
	16	16	16

Sophomore			
Course	F	W	S
English 10	—	—	5
Forge Prac. 81a, 84	—	2	2
Ind. Ed. 40	—	—	2
Physics 31, 32	5	5	—
Physiology 4	—	5	—
Psychology 53	5	—	—
Radio 21	4	—	—
Speech 5	—	—	3
M.S. 4, 5, 6	1	1	1
Electives	1	3	3
	16	16	16

*On leave.

†Students deficient in high school mathematics, algebra (b) should register for Math. 34.

Junior			
Course	F	W	S
Art 113, 114	—	2	2
Auto 162	3	—	—
English 110	4	—	—
Ed. 113	—	—	3
Ind. Ed. 107, 141	3	—	2
Psychology 102	—	5	—
Public Health 155	—	3	—
Sociology 70	—	—	5
Woodwork 170	—	2	—
Ind. Ed. 142	3	—	—
Electives	3	4	4
	16	16	16

Senior			
Course	F	W	S
Ed. 114	3	—	—
Ind. Ed. 109, 121, 110	5	3	3
Ind. Ed. 154, 123, 112	3	6	8
Electives	5	7	5
	16	16	16

Industrial Arts Courses

13. Driver Training. Designed for those who desire to learn to drive an automobile correctly and safely. Includes a study of traffic rules and regulations essential to sound driving; physical qualifications and tests of drivers; general mechanics, operation, and servicing of the automobile; highway safety engineering; and actual supervised training in dual-control cars. Two lectures, lab arranged. (2F, W or S) **Beecher**

40. Sheet Metal. Fundamental operations and tool processes of sheet metal work. Articles are made from black iron, galvanized iron, and bright tin that give practice in pattern developing, cutting, soldering, seaming, riveting, wiring, etc. Two 3-hour lab. (2S) **Hailes**

43. Recreational Crafts. Especially for students majoring in recreational leadership. Consists of two parts: (1) planning and organizing craft work as a part of community recreational programs, and (2) laboratory work in various craft fields, such as wood, leather, plastics, metals, etc. One lecture, one 3-hour lab. (2F) **Hailes**

112. Observation and Directed Teaching. Students observe and teach in Industrial Arts shops near the College. Each student, under close supervision, does practice teaching in various Industrial Arts courses recommended by the State in both junior and senior high schools. (8W or S) **Mortimer and Hailes**

113. Driver Education and Traffic Safety. To acquaint prospective teachers and others with available instructional materials in the field of driver education and the latest methods of presenting such materials in the classroom and on the road. Supervised practice will be arranged for each student. (3S) **France**

123. Curriculum Problems in Industrial Arts. To teach prospective junior high school industrial arts instructors the application of skills and knowledge acquired in basic shop courses. Each prospective instructor constructs projects that are suited to the work recommended by the State Department of Education. They also prepare lesson plans and teaching aids that supplement and aid teachers in carrying out the program. Prerequisites: Course of Study Building and basic shop courses in Wood, Drawing, Metal, Electricity, and Crafts. Three lectures, five 2-hour labs. (6W) **Mortimer and Hailes**

141. Art Metalwork. Laboratory work in embossing, sinking, engraving, etching and metal spinning operations. Work is done in copper, brass, and aluminum on projects designed for utility and artistic merit. Prerequisites: Art 2, Machine Work 51b. Two 3-hour labs. (2S) **Hailes**

142. Plastics. Acquaints students with the new and important group of plastics materials now being produced and the fundamental operations used in working these materials. Students complete projects in hand and machine work. Special emphasis will be given to the place of plastics in a modern industrial arts program. Three 3-hour labs. (3F) **Hailes**

TRADE AND INDUSTRIAL EDUCATION

Designed primarily for instructors and supervisors in Vocational Technical Education and/or in Vocational Industrial Education Programs. A candidate for this degree must show evidence of successful trade and teaching experience, together with the general education requirements necessary for State Certification in his field. Observation and Directed Teaching in the major and minor fields may be substituted for the teaching experience. The trade and teaching experience must be approved by a committee consisting of the Chairman of the Division of Technology and the Department Heads concerned.

CURRICULUM

Degree: Bachelor of Science in Industrial Education

Major: Trade and Industrial Education

- A. 48 credits Trade training or equivalent.
- B. 49 credits General group and English composition requirements.
- C. 33 credits Education and psychology (upper division)
- D. 20 credits Technician training (upper division)
- E. 36 credits Recommended electives (including English 111 or 112)
- F. 6 credits MS or PE.

192 Total credit hours

Industrial Education Courses

21. Industrial and Labor Relations. Basic aspects of labor and management relations in present day industry, with attention to the human element in industrial relations. An orientation course for students preparing to enter industry with a certificate of completion in a two-year vocational technical program. Three lectures. (3S) **McBride**

102. Instructional Aids. Instruction in the purpose, types, sources, preparation and proper use of audio and visual aids, including samples, models, charts, graphs, slides, still film, movie film, sound film, stereoptical projection, recording, sound systems, and other aids suitable for classroom and auditorium use. Three lectures. (3; arranged) **Staff**

104. 204. Occupational Analysis. Principles and practice in analyzing occupations for the purpose of determining teaching content. Students complete an analysis of one unit for a trade or occupation. Three lectures. (3; arranged) **Staff**

107. Principles and Objectives of Industrial Education. Acquaints students with the general philosophy and purposes of Industrial Education, and enables them to understand and appreciate its place in the modern educational program. Students study and compare the general principles and objectives of Industrial Arts Education and Trade and Industrial Education with those of other educational programs. Three lectures. (3F) **Mortimer**

109. Course of Study Building in Industrial Education. To teach students to prepare and use a course of study consisting of the outline, analysis, progress charts, lesson plans, instruction sheets, references, tests, and instructional schedule. Each student completes this work for one unit of instruction. Five lectures. (5F) **Mortimer**

110. Shop Organization and Management. Teaches students to organize and manage an Industrial Education shop of the unit, general, or multiple activity type. Each student prepares, for one type of shop, a complete plan of organization and management dealing with the necessary equipment, materials, supplies, methods of purchasing, financial control, and problems of shop arrangement. Three lectures. (3S) **Mortimer**

111. The General Shop. Consists of a comprehensive study of the "General Shop" type of organization; its advantages and limitations; the content and organization of subject matter applicable to this type of organization, together with suitable methods for presenting subject matter. Class control and the trends of the program are given consideration. Prerequisite: I.E. 107. Three lectures. (3; arranged) **Staff**

120. Personnel Relations. Training for leadership in industry as foremen, supervisors and directors. Problems in organizing, supervising, training and directing personnel. A series of directed conferences based on student experiences and directed studies in leadership problems and principles. Three lectures. (3F, W or S) **McBride**

121. Methods in Industrial Education. The latest methods and techniques of teaching as applied to individual and group instruction in the fields of Industrial Education. Each student has the opportunity of using these different methods in presenting lessons before the class. Three lectures. (3W) **Mortimer**

124. History of Industrial Education. Deals with the historical developments of manual and industrial education from the early leaders to the present time. Emphasis is given to the influence that various leaders and movements, both in Europe and America, have had upon present day objectives of industrial arts and vocational industrial education. Three lectures. (3; arranged) **Staff**

154. 254. Measurements in Industrial Education. Construction and use of the various types of tests and rating scales used in industrial education. Emphasis is placed upon measurable factors in industrial education and the types of tests best suited to this field. The elements of statistical methods necessary for an intelligent use of the tests are covered. Prerequisites: Psy. 102. Three lectures. (3; arranged) **Mortimer**

167. Special Problems in Industrial Education. Designed for qualified students majoring in Industrial Education who wish to do specialized work not covered by other courses. Approval of the major professor and instructor must be obtained. Any quarter. Time and credit arranged. **Staff**

251. Administration of Industrial Education. The laws, regulations and policies affecting Industrial Education Programs; organization and management necessary for the successful operation of these programs; and pertinent problems and their solutions. Students prepare a plan of administration suitable for their school or district. Three lectures. (3; arranged) **Staff**

252. Supervision of Industrial Education. Latest methods in supervision of

Industrial Arts Education and Trade and Industrial Education. For administrators, supervisors, and teachers in service who are responsible for the improvement of industrial arts and vocational education through supervision, or for students who wish to prepare for supervisory work. Students prepare for a plan of supervision suitable for their situation. Three lectures. (3; arranged) **Staff**

253. Coordination in Industrial Education. Functions of coordinators in their relationship to the administration and supervision of industrial education programs; responsibilities and duties of coordinators; emphasis on procedures most successful in performance of these duties. Three lectures. (3; arranged) **Staff**

255. Techniques in Writing Instruction Sheets. Principles underlying the development of instruction sheets for use in industrial arts and trade and industrial education programs. Three lectures. (3; arranged) **Staff**

259. Planning and Equipping Industrial Education Buildings. Principles and practice in planning and equipping modern industrial arts laboratories and trade and industrial shops. For administrators, supervisors, directors, architects, and others interested in planning new or remodeling existing facilities. Students study the basic plans of laboratory or shop design and arrangements of equipment, and apply these principles to the solution of their particular problems. Two lectures, one 3-hour lab. (3; arranged) **Staff**

260. Diversified Occupations. Content, methods, and special devices to be used in the teaching of Diversified Occupations. Emphasis is placed upon pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for one unit of instruction in Diversified Occupations. Three lectures. (3; arranged) **Staff**

261. Part Time Education. Content, methods, and special devices to be used in Part Time Education programs. Emphasis is placed upon pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for a course in Part Time Education. Three lectures. (3; arranged) **Staff**

262. Supervisory Personnel Development Institute. An institute for the training of conference leaders, supervisors, and administrative personnel in the methods and techniques of presenting conferences, and personnel training. Three lectures. (3; arranged) **Staff**

263. Evening School Programs. Development, organization and improvement of evening school programs in Industrial Education. Students prepare a syllabus covering the essential materials needed for such a program. Three lectures. (3; arranged) **Staff**

264. Conference Leading. Principles and practice in conference leading as it applies to the methods used in industry. Emphasis given to the preparation, use, and evaluation of this method as it affects Industrial Education Programs. Three lectures. (3; arranged) **Staff**

265. Apprenticeship. Development, organization, and improvement of apprentice training programs for industry. Students prepare a syllabus covering the essential materials needed for such a program. Three lectures. (3; arranged) **Staff**

266. Related Instruction. Content, methods, and special devices used in teaching related subjects in Vocational programs. Emphasis in pertinent problems and their solutions. Students prepare a syllabus covering the essential materials for one unit of Related Instruction. Three lectures. (3; arranged) **Staff**

267. Reading and Conference. Provides for study in advanced and specialized problems in Industrial Education. Problems are selected with the approval of the department head, investigation being carried on under the direction of the major professor. (Arranged) **Staff**

271. Research and Thesis Writing. Provides for individual work in thesis writing in Industrial Education. The thesis is written in accordance with standard thesis requirements and under the direction of the major professor. (Arranged) **Staff**

290, 291, 292. Advanced studies under plan "B." Special library and seminar problems or studies designed to meet requirements for reports under plan "B." 2-3 credits each quarter. **Staff**

Note: In an effort to be of maximum service to the Industrial Education teachers and supervisors in this Intermountain Region in keeping them current

with the national picture in Industrial Education, the Industrial Education Department has organized special courses primarily for these teachers in service as they attend Summer Session to do graduate work. The notation "Arranged—Staff" is made for the specific purpose of bringing in as visiting staff, noted leaders for these courses as the situation demands.

PHOTOGRAPHY

H. Reuben Reynolds, Professor; **Bert V. Allen**, **Fred R. Pryor**, Instructors

The photography unit is jointly administered by the departments of Industrial Education in the School of Engineering and Technology and the Department of Art in the School of Education. General service courses are available for college students desiring instruction in the fundamentals of photography and in advanced work. A special two-year curriculum is available for students wishing to prepare themselves as Commercial Photographers. Sufficient courses are available for a major in photography for those desiring a Bachelor of Science degree and the work may be done in either the Industrial Education Department or the Art Department. If the work is done in the Art Department, the student is to take the courses specified by the Art Department for the major in photography and the student's program should be planned with and approved by the department head. If the work is done in the Industrial Education Department, the student may choose either one of two programs, namely: (1) The Industrial Education program leading to a Unit Shop Certificate, or (2) the Industrial Technology program. In either program, the student should plan his entire program and have it approved by the department head not later than the first quarter of the student's Junior year.

Some of the courses offered are designed especially as service courses for students registered in Agriculture, Journalism, Engineering and Technology, Forestry, and other specialized fields where photography will supplement their major.

Two-Year Curriculum in Photography leading to a Certificate of Completion in Commercial Photography

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
Photo. 61, 62, 63	5	5	5	Photo. 64, 65, 66	5	5	5
Art 1 (3, 26, 33, 32)	3	3	3	B.A. 64, 65, 66	3	3	3
English 17, 18, 19	3	3	3	Ag. Econ. 53, 54	3	3	—
Math. 34	3	—	—	Psych. 53	—	5	—
Phys. 31, 32	—	5	5	Zool. 1 or Bot. 1	5	—	—
Landscape 20	3	—	—	Physiol. 4	—	—	5
M.S. 1, 2, 3	1	1	1	Journ. 112	—	—	3
	18	17	17	M.S. 3, 4, 5	1	1	1
					17	17	17

Description of Courses

51. General Photography. Principles and practices in the fundamentals of general photography. Training in the selection and use of cameras, lenses, meters, films, filters, lights, developers, and accessories. Two lectures, one 3-hr. lab. (3F, W or S) **Pryor**

61. Introductory Photography. Training in taking still pictures. The units include selection of materials; exposing and developing of films; contact printing; enlarging; and trimming and mounting of prints. This is the first of a series of units in photography having as their objective the preparation of technicians in this field. Prerequisite for other photography courses. Three lectures, one 3-hour lab. (5F, W or S) **Allen**

62, 162. Industrial Photography. Training in news, architectural, and machine photography. The units include photoflash, interior lighting, action and news, still life, table-top, fashion, building, machine and aerial photography applied

to this field. Blocking, photomontage, and air-brush work also are included. Prerequisite: Photo 61. Two lectures, three 3-hr. labs. (5F) **Allen**

63, 163. Agricultural Photography. Training in all types of agricultural, stock, poultry, farm, architectural and science photography. Also aerial photography applied to this field. Prerequisite: Photo 61. Two lectures, three 3-hr. labs. (5S) **Allen**

64, 164. Motion Picture Photography. The technique needed in the various types of work in 8 mm. and 16 mm. cameras and projectors. Planning the production, camera technique, lighting, filters, close-up photography, titles, editing and projection. Prerequisites: Photo. 51 or 61. 2 lectures, three 3-hr. labs. (5S) **Reynolds**

65, 165. Portrait Photography. Training in portrait and group photography. The units include model directing, lighting, posing, head and shoulder, three quarter, full length, fashion, and group photography. Considerable emphasis will be placed upon child and home portraiture. Prerequisite: Photo 61. Two lectures, three 3-hr. labs. (5W) **Allen**

66, 166. Color Photography. Problems in color, Ektochrome and Kodachrome, use of tungsten, daylight and flash technique, printing processes, composition in color arrangement. Prerequisite: Art 32, Photo. 51 or 61. Three lectures, two labs. (5F) **Reynolds**

67, 167. Abstract Composition. Symbolic interpretation, texture studies, symbolism in portraiture, table-top technique, negatives combined with photograms, solarization and multiple exposure, and other techniques used in modern advertising and illustration. Prerequisites: Photo 51 or 61. Two lectures, three labs. (5W) **Reynolds**

151. Photographic Problems. Special problems in advanced photography. Designed to meet the needs of individual students in solving advanced photographic problems. This course may be repeated when desirable but not to exceed three times total registration. Repeating students must have the approval of the major professor and the department head. Prerequisite: Photo 51 or 61. Two lectures, two 2-hr. labs. (3F, W or S) **Allen**

Metalwork and Mechanical Drawing

The Department of Metal and Mechanical Drawing is composed of four units: Machine Tool, Welding, Forging, and Mechanical Drawing. While these units have separate laboratories and are complete within themselves, yet they function together as a coordinated program in Metalwork.

The department, through each of its four units, offers general service courses for those students desiring basic instruction in Metalwork. It also offers two-year courses for those students preparing to enter the skilled occupations.

The curricula lead to the degree of Bachelor of Science in Industrial Technology, with majors in Machine Tool Technology or Welding. The courses are listed under the separate units of this department.

MACHINE TOOL TECHNOLOGY

Frederick Preator, Professor; **G. Merrill Shaw**, Assistant Professor.

W. Karl Somers, Instructor

This department offers a four-year degree program which leads to the degree of Bachelor of Science in Industrial Technology. To young men with special aptitudes in mechanical work, mathematics, and drafting, an excellent opportunity is provided to train for precision tool work, jig and fixture design, tool and gauge making, drafting, and tool design. Work taken in this department lays a foundation for work in closely allied fields such as: mechanical inspection, production control, tool planning, tool engineering, or designers in the several branches of engineering.

The machine tool laboratory courses also give excellent training for students who are preparing for a career where mechanical work is needed. Students in engineering, electrical work, auto mechanics, diesel work, or work with farm machinery will find these courses suited to their needs.

The machine tool laboratories have a floor space of 5,000 square feet with an additional heat-treating and inspection laboratory. They are equipped with: 25 engine lathes, three milling machines, one planer, three shapers, three precision tool grinders, five drill presses, five tool grinders, one Doall machine, two punch presses and one power hack saw. The laboratory is well supplied with all the necessary hand tools such as vises, bench tools, drills, reamers, gages, taps, dies and micrometers.

The heat-treating laboratory has five electric furnaces, draw baths, tensile testing, impact testing, and hardness testing machines. The inspection laboratory has precision gage blocks, sine bars, electric comparators, polishing heads and microscopes for mechanical inspection work.

The degree course places emphasis on training students who will be well prepared to work with experimental problems, mechanical developments, and research. There is an increasing need for well-trained men in these fields.

A joint program of cooperative training with Utah industries has been worked out for senior students which requires registration for one summer session. Only students who are candidates for the B. S. Degree with high scholastic average may register for plant training courses.

All members of the teaching staff are qualified members of the American Society of Tool Engineers, and sponsor a Tool Engineer's Club affiliated with the National Society. For junior and senior students, field trips to industrial plants are conducted each year.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology

Major: Machine Tool Technology

Freshman			
Course	F	W	S
English 17, 18, 19	3	3	3
MTT 51, 52, 53	5	5	5
Math. 34, 35, 44	3	5	3
MD 91, 92, 93	2	2	2
Speech 5	—	—	3
MS 1, 2, 3	1	1	1
Elective	3	—	—
	17	16	17

Sophomore			
Course	F	W	S
Math. 97, 98, 99	5	5	5
Physics 20, 21, 22	5	5	5
MTT 54, 57, 58	3	2	2
CE 63, MD 95, MTT 151	3	3	3
MS 4, 5, 6	1	1	1
	17	16	16

Junior			
Course	F	W	S
CE 101, 102, 103	4	4	4
Chem. 10, 11	5	5	—
Econ. 51	—	—	5
MTT 152, 153, 181	5	5	5
MTT 150	3	—	—
PS 12, 13	—	3	3
	17	17	17

Senior		Credits
Course		
MTT 182, 183		10
MTT 185, 186 (or electives)		12
MD 195, 196		6
English 112		4
Psy. 155		3
Aero 131		2
Weld. 91, 94		6
Phsio. 4		5

48

Description of Courses

Any five credit course in Machine work may be completed by taking part of the course during one quarter and the other part during a later quarter.

NOTE: Three credit courses in Machine Practice are scheduled each quarter.
See Time Schedule Bulletin.

51, 52. Machine Tool Practice. Training in the use of hand tools, and in bench work and tool sharpening, together with elementary training on drill press and engine lathe. Tools and machine parts are made that give practice in the operations essential to machine shop work. Included are assignments of reading on machine work subjects, and application of mathematics to machine work. (3-5F, W, or S) **Somers**

53, 54. Machine Tool Practice. (Shaper and Milling Machines.) An introduction to work on the shaper, planer, and milling machines. A program is outlined to develop the student's ability on these machines so as to give him a broader training for advanced work. (3-5 F, S) **Preator**

56. Machine Practice for Engineers. Designed to acquaint engineering students with basic machine shop operations, including the use of hand tools, bench work, tool sharpening, and elementary engine lathe and drill press operation. (2F, W or S) **Somers**

57. Precision Inspection. The theory and practice of precision measurement is given in lecture and demonstration. Students learn to use gage blocks, precision measurement equipment, to check calculations, to read material specifications, and to make a complete inspection. (Prerequisite: Math. 44) (2W) **Preator**

58. Manufacturing Processes. A course to acquaint the student with the fundamentals of important manufacturing processes such as: foundry work, die casting, forming, molding, welding, broaching, and various assembly methods; to know the possibilities and limitations of the processes and their application to the fabrication of industrial products. (2S) **Somers**

150. Metals and Heat Treatment. A study of the physical properties, composition, constituents, and heat treatment of metals used in industry. The metals and heat treatments studied include cast iron, wrought iron, plain carbon steel, alloy steels, brasses, bronzes, aluminum alloys and magnesium alloys. Prerequisite: Chemistry 10. (3F) **Preator**

151, 152. General Machine Work. Advanced lathe, planer and milling machine work, grinding milling cutters, making general shop tools, and special shop equipment. Prerequisites: MTT 51, 52, 53. (5F, W) **Somers and Preator**

153. Tool Work. An introduction to tool and die making. The student makes for his own use the specialized and valuable tools and equipment which are necessary for making and assembling the projects in the tool and die courses. Required of all major students. (5S) **Somers**

181, 182, 183. Tool and Die Making. Three courses in tool work. Problems in gage making; jig and fixture work, and die work, with design problems. Prerequisites: Mech. Dwg. 95; MTT 150, 153; Math. 44. (5F, W or S) **Preator**

185, 186. Cooperative in Plant Training. A cooperative training course conducted by the college and industry to supplement the students' academic work with plant experiences and better qualify him for industrial opportunities. (6 credits each quarter)

MECHANICAL DRAWING

Frederick Preator, Professor; **G. Merrill Shaw**, Assistant Professor.

The Mechanical Drawing unit is in the Metalwork Department and offers its service courses in drafting to all departments of the college.

The drafting unit consists of two well-lighted laboratories with a total floor space of 2700 square feet, and is equipped to handle 60 students at individual drafting tables. Modern equipment such as drafting machines, and the different printing machines and printing processes are made available to the students.

The mechanical drawing classes 91, 92, and 93 are basic courses and are offered as services to all departments. Special emphasis is placed on the fundamentals of good drafting room practices, and on the types of drawings used in industry.

Students may qualify for a minor in mechanical drawing on completion of 18 credits including C. E. 63, Descriptive Geometry.

91, 92, 93. Mechanical Drawing. The use of instruments is applied to template drawings, graphic solutions, and lettering; to standard elements and symbols which make up working drawings used in industry. Shape description and size description are stressed as they are represented in orthographic projections, sections, auxiliaries, and revolved views. Isometric drawings and pictorial views are made from orthographic projections. (2F, 2W, 2S) **Preator and Shaw**

94. Working Drawings and Specifications. An introduction to architectural drawings and specifications as applied to building and construction problems. Scale drawings including plans, elevations, sections and construction details are completed with tracings and prints. Prerequisites: 91, 92, 93. (3W) **Shaw**

95. Machine Drawing. Problems pertaining to machinery drives and fastenings, mechanisms of power and motion and the design of machine parts incorporating standard methods consistent with industry. Prerequisites: 91, 92, 93. (3W) **Preator**

194. Mechanical Perspective. Practical problems in angular, parallel and oblique perspective. Techniques in rendering finished drawings. Prerequisites: 94 or 95. (Taught alternate years with M.D. 195) (3S) **Shaw**

195. Industrial Production Illustration. Translation of working drawings into dimetric and trimetric projections, exploded views, and assemblies as a means of rendering industrial illustration. Prerequisite: 94 or 95. (3S) **Preator**

196. Aircraft Drawing. Problems common to aircraft work are used. Special aircraft techniques, numbering systems, change methods, and technical specifications are stressed. Prerequisite: 95. (3S) **Preator and Shaw**

FORGE PRACTICE

J. Donald Wadsworth, Assistant Professor

The Forge Practice Unit of the Department of Metalwork and Mechanical Drawing provides general service courses for the various departments on the campus. These courses are in forging, bench metalwork, and ornamental iron work. They are open to all college students.

The Forging Laboratory is equipped with hand tools, shop equipment, and necessary materials for complete work in this field.

Forging is basic to the metal working trades and industries. Its fundamental operations are used in fabrication, construction, maintenance and repair, and in many forms of manufacturing. Students in Engineering, Technology, Agriculture, and many related fields will profit by basic training in forge practice.

Description of Courses

11. Forging and Bench Metal Work. (Especially designed for Engineering and Agricultural students.) The instruction is equally divided between hot and cold metalwork. The first deals with fundamental forging operations such as shaping, bending, forge welding, hardening and tempering. The second part of the course consists of the use of hand and power metal working tools and layout work. Two labs. (2F, W or S) **Wadsworth**

81. Forge Practice. From fundamental forging operations to plow share and trip hammer work. Excellent training for welders and T & I students in the metal trades. Five labs. (5W) **Wadsworth**

82. Forge Practice. Fundamental operations of forging. Recommended for Industrial Arts, Woodworking and Building Construction students. Two labs. (2F, W, S) **Wadsworth**

83. Forge Practice. A beginning course in forge practice, more extensive than 82. Three labs. (3F, W or S) **Wadsworth**

85. Forge Practice. Advanced forging with emphasis placed on farm tools and implements. Prerequisites: Forge Practice 82 or 83. Three labs. (3W) **Wadsworth**

184. Ornamental Iron Work. Designing and making of iron furnishings, interior and exterior railings, wrought iron furniture, frilles, jardiniers, sign brackets, etc. Prerequisites: Any of the above forge practice courses. Two labs. (2S)

Wadsworth

WELDING

A. B. Kemp, Rawson Child, Instructors

The Welding Unit of the Department of Metalwork and Mechanical Drawing offers progressive instruction in Oxy-Acetylene and Electric-Arc Welding. General service courses are provided for those students wishing a fundamental knowledge of this modern field of industry. Completion of the four-year curriculum leads to the degree of Bachelor of Science in Industrial Technology. This program combines a technical program with a broad general education and prepares students to enter industry as skilled technicians, sales engineers, or to enter the welding business for themselves. A two-year Vocational Technical program is available for students preparing to enter the industry as skilled workers.

Modern industry is teeming with opportunities to apply welding to design, processes, materials, machinery and devices. Welding will play a large part in providing food, clothing, shelter, power and transportation for future civilization. The extent of this development will depend upon the training and preparation of today's youth for tomorrow's industry.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Welding Technology

Freshman				Sophomore			
Course	F	W	S	Course	F	W	S
Welding 41, 42, 43	10	10	10	Welding 44, 45, 46	10	10	10
English 17, 18, 19	3	3	3	Math. 34, 35, 44	3	5	3
Metalwork 51a	—	2	—	M.S. 4, 5, 6	1	1	1
Forge Prac. 81a	2	—	—	Electives	3	2	3
Mech. Dwg. 91, 92, 93	2	2	2				
M.S. 1, 2, 3	1	1	1				
	18	18	16		17	18	17
Junior				Senior			
Course	F	W	S	Course	F	W	S
Physics 20, 21, 22	5	5	5	Welding 190, 191, 193	3	3	3
Chemistry 10	5	—	—	C.E. 101, 102, 103	4	4	4
Math. 97, 98, 99	5	5	5	C.E. 192	—	3	—
Zoology 111	—	—	4	English 111	—	—	4
Psychology 53	—	5	—	B.A. 109	3	—	—
Ag. Econ. 53a, b	3	3	—	M.W. 150	3	—	—
Electives	—	—	3	Electives	3	5	5
	18	18	17		16	15	16

Two-Year Vocational Technical Program
Technical Certificate in Welding

First Year:				Second Year:			
Course	F	W	S	Course	F	W	S
Welding 41, 42, 43	10	10	10	Welding 44, 45, 46	10	10	10
W.W. 6	3	—	—	English 17, 18, 19	3	3	3
Forge Prac. 81a; 84	2	—	3	M.W. 51a	—	2	—
Mech. Dwg. 91, 92	2	2	—	Forging 11	—	—	2
Econ. 27	—	2	—	Ind. Ed. 40, 21	2	—	3
Psychology 33	—	—	3	Auto 52, 53	3	3	—
Electives	—	3	—				
	17	17	16		18	18	18

Description of Courses

In all of the following courses, various techniques and welding positions are practiced. American Welding Society (A.W.S.) tests are made on samples welded in different positions. Safety precautions and proper use of equipment are emphasized.

***41. Acetylene Steel Welding.** (Technical and Shop.) Training in fusion welding and cutting of mild steel by means of oxy-acetylene welding equipment. (Tech. 5; Shop 5; F) **Kemp**

42. Acetylene Cast-Iron Welding. (Technical and Shop.) Training in fusion welding and brazing of cast iron and bronze welding of malleable casting with oxy-acetylene flame. Special problems in the pre-heating of castings are introduced. (Tech. 5; Shop 5; W) **Kemp**

***43. Acetylene Aluminum Welding.** (Technical and Shop.) Training in the welding of aluminum, stainless steel, miscellaneous alloys, and non-ferrous metals with oxy-acetylene and Heli-arc welding equipment. Attention is given to pipe welding, hard surfacing and flame hardening. (Tech. 5; Shop 5; W) **Kemp**

***44. Electric Steel Welding.** Training in fusion welding of mild steel by means of electric-arc welding equipment. (Tech. 5; Shop 5; F) **Kemp**

45. Electric Cast-Iron Welding. (Technical and Shop.) Training in fusion welding of bronze, cast-iron and malleable castings with the electric-arc. (Tech. 5; Shop 5; W) **Kemp**

46. Electric Aluminum Welding. (Technical and Shop.) Training in the welding of aluminum, stainless steel, and non-ferrous metals with the electric-arc. Attention is also given pipe welding and hard surfacing. (Tech. 5; Shop 5; S) **Kemp**

91. Acetylene Welding. Principles and practice in the fundamentals of oxy-acetylene welding and cutting. A general course open to all college students. Two lectures, two 2-hr. labs. (3F, W or S) **Child**

92. Aero Welding. Principles and practice in welding steel and alloy steel tubing as practiced in aircraft construction and repair. Attention will be given to resistance welding. Two lectures, two 2-hr. labs. (3F) **Staff**

93. Advanced Aero Welding. Open only to advanced students in aircraft welding and provides instruction pertinent to qualifying for CAA Aircraft Mechanic License. Prerequisite: 92. Two lectures, two 2-hr. labs. (3W) **Staff**

94. Electric Welding. Principles and practice in the use of the latest types of electric-arc welding equipment. Safety measures and methods used in arc-welding of steels. Two lectures, two 2-hr. labs. (3F, W or S) **Child**

96. Engineers Welding Laboratory. Exploration in modern welding. Students receive basic instruction and practice in the use of oxy-acetylene welding and cutting, electric-arc welding, and spot welding equipment. Two 3-hr. labs. (2F, W or S) **Child**

190. Advanced Acetylene Welding. Principles and practice in welding metallurgy pertaining to acetylene welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hard-surfacing and flame hardening. Laboratory welding in vertical and overhead positions, and testing welds by means of the tensile hardness, etching, and microscope. Two lectures, two 2-hr. labs. (3F) **Kemp**

191. Advanced Electric Welding. Principles and practice in welding metallurgy pertaining to electric welding of mild steel, cast iron, bronze, aluminum, stainless steel, low carbon alloy steel, hardsurfacing, and flame hardening. Laboratory welding in vertical and overhead positions and testing welds by means of the tensile hardness, etching, and microscope. Two lectures, two 2-hr. labs. (3W) **Kemp**

193. Welding Seminar. Current topics in production methods, cost, design, and manufacture of welded products as used in modern industry. (2S) **Kemp**

Radio and Electronics

Larry S. Cole, Clayton Clark, Associate Professors; William L. Jones, Assistant Professor.

This department offers a standard four year curriculum leading to the Bachelor of Science Degree in Radio and Electronics. The objective of this course is to provide students with sufficient theoretical and practical background to enable them, as graduates, to occupy responsible technical positions in the various branches of the radio industry, including broadcasting, manufacturing and general electronics; communications generally and the various civil service positions in the field.

Recent developments in these fields have created an increasing demand for men who are adequately prepared. Past graduates of this department have found excellent employment opportunities. The department maintains contacts with broadcast stations, radio manufacturers, laboratories and civil service agencies to give employment assistance to graduates.

Complete laboratory facilities and modern testing and measuring equipment are available to carry out an extensive laboratory program and give the student ample practice and experience during his training. Special items include broadcast studio facilities with control, monitor and recording equipment; radio transmitters to 1000 watts, commercial and composite types; communication receivers; complete radar sets and other UHF equipment; an adequate stock of parts, tubes and supplies for instructional and experimental work.

CURRICULUM

Degree: Bachelor of Science in Radio and Electronics									
Freshman					Sophomore				
Course	F	W	S		Course	F	W	S	
Radio 23, 24, 25	2	2	3		Radio 80, 81, 82	5	5	5	
Math. ¹ 35, 46, 97	5	5	5		Math. 98, 99, 122	5	5	3	
Chem. 10, 11	5	5	—		Physics 20, 21, 22	5	5	5	
English 17, 18, 19	3	3	3		C.E. 81	—	—	3	
C.E. 61, 62, 63	2	2	3		M.S. and T. 4, 5, 6	1	1	1	
Shop ²	—	—	3						
M.S. and T. 1, 2, 3	1	1	1						
	18	18	18			16	16	17	
Junior					Senior				
Course	F	W	S		Course	F	W	S	
Radio 125, 126, 110	5	5	5		Radio 120, 129, 160	5	5	3	
Radio 150	—	2	—		Radio 140, 141, 142	5	5	3	
Physics 175, 176, 177	3	3	3		Radio 151, 152, 153	2	2	2	
C.E. ³ 101, 102, 103	4	4	4		Radio 175, 176, 177	1	1	1	
Geology 3	—	—	5		English 111	—	—	4	
Econ. 51	5	1	—		C.E. ³ 196, 197	4	4	—	
Speech 82	—	2	—		B.A. 109	—	—	3	
	17	16	17			17	17	16	

Description of Courses

21 Fundamentals of Electricity. A course especially designed for students majoring in Industrial Arts, Automotive, Refrigeration, Welding, etc., covering basic principles of practical and applied electricity. Principles of Electricity;

1—Students deficient in high school algebra (b) and solid geometry will also be required to take Math. 33 and 34.

2—Shop may be metal work or welding.

3—Students not planning graduate study may substitute other approved courses for C.E. 196, 101, 102, 103.

D.C. and A.C. circuits; power; wire and wiring; motor, generator, and transformer principles; batteries; electrical measurement. Prerequisite: Math. 34. Four lectures. (4F, W or S) **Staff**

23, 24 and 25. Basic Electricity. (For Communications.) Introduction to the fundamentals of electricity; direct and alternating current circuits and circuit components; magnetism; motors, generators, and batteries; elements of electron tubes. The laboratory work includes soldering, wiring and use of schematic diagrams; construction of basic type units; measurements in electric circuits. 1 lect., 1 lab. Ra23: 1 lect., 1 lab. (2F). Ra24 1 lect., 1 lab. (2W). Ra25, 2 lect., 1 lab. (3S) **Staff**

31, 32, 33. Code Practice. These courses will train the beginner to send and receive correctly 15 to 20 words per minute. The actual speed attained will depend on individual ability. Optional, but recommended for all radio majors. (1F, W, S) **Staff**

80. Direct Current Circuits. Applications of Ohm's Law, Kirchhoff's laws and network theorems to the solution of simple and complex resistive circuits; L-R and C-R circuit analysis; resistive matching networks; magnetic and electric fields and circuits. Five lectures. (5F) **Jones**

81. Alternating Current Circuits. Fundamentals of alternating currents; application of vector algebra to the solution of AC circuits; application of network theorems to AC circuit problems; resonant circuits; introduction to reactive matching networks; elements of complex wave analysis. Prerequisite: RA 80. Five lectures. (5W) **Jones**

82. Electron Tubes. Fundamentals of thermionic emission and operation of vacuum and gas filled tubes; basic principles of electron tube circuits and methods of analysis; applications of electron tubes in radio equipment; measurements and testing in electronic circuits; power supplies. Prerequisite: RA 80. Three lectures, two labs. (5S) **Jones**

110. Communication Circuits. Principles and characteristics of transmission lines, networks, matching sections and filters used in communication systems. Prerequisite: RA 81. Four lectures, one lab. (5S) **Cole**

120. Antennas. Fundamentals of radio antennas, radiation and wave propagation; adjustment and construction of all types of antennas; directional arrays; feeder lines and matching networks; antenna and field strength measurements. Prerequisite: RA 110. Three lectures, two labs. (5F) **Clark**

125. Audio Frequency Amplification. Principles, characteristics, and construction of resistance, impedance, and transformer coupled audio amplifiers; radio circuit constants and measurements; Class A, AB and B power amplifiers. Prerequisite: RA 82. Three lectures, two labs. (5F) **Cole**

126. Radio Frequency Amplification. Principles, characteristics, and construction of R.F. voltage and power amplifiers; neutralization and adjustments; modulation; R.F. circuit constants; oscillators and detectors. Prerequisite: RA 92. Three lectures, two labs. (5W) **Clark**

129. Electroacoustics. Elements of acoustics; acoustic problems of studios and auditoriums. Principles and characteristics of loud speakers, microphones and pickups. Principles and operation of disc, wire and tape recorders. Studio consoles; mixers, equalizers and amplifier compensation; measurements and testing of audio and sound equipment. Prerequisite: RA 125. Three lectures, two labs. (5W) **Cole**

140. UHF Circuits. Complex wave analysis; wide band amplifiers; square wave testing; voltage regulation; special transmission networks for UHF modulating signals; measurements with cathode ray oscilloscopes; application of transmission line theory in the UHF spectrum. Prerequisites: RA 120, 126. Three lectures, two labs. (5F) **Clark**

141. UHF Techniques. UHF generators; cavity resonators; wave guides; parabolic and horn radiators; applications of UHF to radar and other complete systems. Laboratory facilities include a complete mark 16 navy radar in the 10 cm region. Prerequisite: RA 140. Three lectures, two labs. (5W) **Clark**

142. Television and F.M. Systems. A resume of the elements of present television and F.M. transmitter and receiver systems; facsimile and teletype systems. Three lectures. (3S) **Clark**

150. Instruments and Measurements. A laboratory course covering the principles, application and use of electrical and electronic instruments; methods and techniques of measurements. Prerequisite: RA 82. Two labs. (2F, W or S) **Jones**

151, 152, 153. Advanced Laboratory. Advanced radio laboratory work in construction of communication units and special equipment; measurements, testing and laboratory techniques. Prerequisite: RA 125, 126, 150. Two labs. (2F, W, S) **Cole, Clark**

160. Industrial Electronics. The application of electronic methods and devices to the measurement, control and regulation of production and testing processes; servo mechanisms; R. F. heating. Prerequisites: RA 125, 126. Two lectures, one lab. (3S) **Clark**

175, 176, 177. Radio Seminar. A weekly meeting of staff and senior Radio majors. Reports and discussions on recent developments in communications and electronics. (1F, W, S) **Staff**

Woodwork and Building Construction

D. A. Swenson, Professor Emeritus; **Joseph Coulam**, **William E. Mortimer**, Professors; **Charles N. Merkley**, Associate Professor; **Ross A. Nyman**, **Dan H. Swenson**, **Charles W. Hailes**, Instructors.

This department offers work in joinery and millwork, building construction, estimating and contracting, pattern making, wood turning, wood finishing, home mechanics, and cabinet work. It offers a curriculum leading to the degree of Bachelor of Science in Industrial Technology with a major in Building Construction; and general service courses that may be used toward satisfying the curriculum in Industrial Arts.

CURRICULUM

Degree: Bachelor of Science in Industrial Technology
Major: Building Construction

Freshman			
Course	F	W	S
English 17, 18, 19	3	3	3
Mech. Dwg 91, 92, 93	2	2	2
Math. 34, 35, 44	3	5	3
Woodwork 61, 62, 63	5	5	5
Woodwork 70	—	—	2
M.S. 1, 2, 3	1	1	1
Electives	3	—	—
	17	16	16

Junior			
Course	F	W	S
Bus. Adm. 147, 148, 100	3	3	3
C.E. 84, Woodwork 73	3	3	—
Art 126	—	3	—
Woodwork 161, 162, 163	5	5	5
Electives	6	3	9
	17	17	17

Sophomore			
Course	F	W	S
Phys. Sc. 31, 32	5	5	—
Mech. Dwg. 94, C.E. 63	—	3	3
Econ. 51	—	—	5
Woodwork 64, 65, 66	5	5	5
Woodwork 72, 68, 60	2	3	3
Radio 21	4	—	—
M.S. 4, 5, 6	1	1	1
	17	17	17

Senior			
Course	F	W	S
Woodwork 171, 172, 173	5	5	5
Forestry 130	—	—	4
Econ. 125	3	—	—
History 135	—	—	5
English 111 or 112	4	—	—
Zoology 111	—	4	—
Electives	5	8	3
	17	17	17

Two-Year Vocational Technical Program
Technical Certificate in Carpentry

First Year:	F	W	S	Second Year:	F	W	S
W.W. 73	—	3	—	W.W. 68	—	3	—
A.C.&R. 61, W.W. 70	—	2	2	W.W. 170, 171, 172	3	2	5
Forge Prac. 81a	—	—	2	W.W. 64, 65, 66	5	5	5
W.W. 61, 62, 63	5	5	5	English 17, 18, 19	3	3	3
W.W. 6, Art 26	3	3	—	M.D. 94, Ind. Ed. 21	—	3	3
M.D. 91, 92, 93	2	2	2	R.A. 21	4	—	—
M.S. 1, 2, 3	1	1	1	M.S. 4, 5, 6	1	1	1
Electives	4	—	4	Electives	—	—	—
W.W. 72, 60	2	—	2				
	17	16	18		16	17	17

Description of Courses

Courses W.W. 61, 62, 63, 74, 160, 171, 172, 173 may be completed by taking part of the course during one quarter and the other part during a later quarter. The three-hour courses are offered 9-12 M. W. F. each quarter, and the two-hour courses are offered 8-11 T.Th. each quarter.

6. Shop Problems. Use is made of simple mathematical formula in solving problems in mechanical work. These include speed ratios, steel square, micro-meter reading, and area and volume problems. Prerequisite: High school algebra and geometry. Three lectures. (3F or W) **Coulam and Nyman**

60. Elements of Plumbing. Includes plumbing specifications, codes, layouts, installations, inspections, cutting and fitting pipe, and repairs. One lecture, one lab. (2S) **Merkley**

61, 62, 63. Joinery and Millwork. Basic training for students preparing to enter the woodworking trades, and those who wish a general knowledge of woodwork. Includes a study of the proper use, care and sharpening of hand tools, machine processes, safety measures, machine operation, care and repair of machines, and sharpening of machine cutters. Assigned reading and application of mathematics to woodwork problems. Projects in bench work and wood turning to give practice in the fundamentals of wood construction. Five labs. (2, 3 or 5F; 2, 3 or 5W; 2, 3 or 5S) **Swenson and Nyman**

64, 65, 66. Building Construction. Laying out and construction of buildings, stressing carpenter work. Includes concrete forming, framing, roof framing, roofing, scaffolding, siding, exterior and interior trim, window and door work. Special attention is given to trade construction methods. Prerequisite: W.W. 63. (5F, W or S) **Merkley**

67. Woodwork for Engineers. Fundamental operations of woodworking. Includes the use, care and sharpening of hand tools and power woodworking equipment, shop safety, lumber grading and its use, reading and use of the steel square. Also wood construction engineering, two or three labs. (2F, W or S) **Merkley and Nyman**

68. House Wiring. For students in building construction courses. Covers the national electrical code and the local codes in Utah communities. Includes the choice of materials, design of circuits and inspection for electrical heat, light, and power installation in homes and small public buildings. Two lectures, one lab. (3W) **Staff**

72. Concrete and Clay Products. Composition of concrete for various purposes, the use and placement of reinforcing agents; waterproofing, coloring, and stone imitation, etc. Composition of bricks, tile, etc., and their strength and thermal conductivity are also studied. Projects are built in the laboratory during the course. One lecture, one lab. (2W) **Merkley**

73. Materials of Industry. Wood and wood products, commercial veneered panels, roof coverings, wall boards, insulating materials, siding, composition panelings, glass products and other non-metal materials used in the building trades. Three lectures. (3S) **Merkley and Mortimer**

74. Home Service Course. Upkeep and general repairs in the home, such as frequently are needed on electrical, plumbing, and other home equipment. Woodwork repairs and furniture refinishing as well as fitting of window blinds and screens, calcimining and wallpaper cleaning will receive attention. Minor repairs to heating, ventilating and refrigeration equipment will also be considered. Open to men and women students. Prerequisite: High school physics or equivalent. Five labs. 2-5 F, W or S)

Hailes

160. Pattern Making. Essentials of pattern making. Simple patterns illustrating construction and choice of materials, principles of shrinkage, etc. Prerequisite: W.W. 61. Five labs. (5F, W or S)

Swenson

161, 162, 163. Building Construction. Estimating and contracting. Construction and design of homes, farm buildings and apartments. Covers porch work, stairways, dormers, special roofs, insulation and other special construction, specification writing, cost estimating, construction methods, allowable loads, and drawing of special sections and details. Problems in actual bidding on sets of plans are worked out by students. Prerequisite: W.W. 66, Mech. Dwg. 94. Three lectures, two labs. (5F, W or S)*

70 or 170. Wood Finishing and House Decorating. Fine wood finishing such as natural finishes, French polishing, hand polishing, stains, paints, enamels, gun work, interior and exterior wood finishes, plaster paints, brick stains, stucco paints, etc. Students are required to do practice work in each type of finishing. One lecture, one lab. (2F, or S)

Mortimer and Nyman

171, 172, 173. Cabinet Work. The design and construction of furniture and cabinets, including a study of the woods suitable for furniture and cabinet making, wood turning, inlaying, and types of wood finishing. Projects are built which include inlaying and overlaying. Prerequisite: W.W. 63. All lab. (5F, W, S)

Nyman and Coulam

174. Art Woodwork. Decorative means that craftsmen employ for artistic appeal. Art turning, chip carving, band saw shaping, scrolling, twisted turning, inlaying and overlaying. Consideration is given decorative effects obtained by two-tone staining, bright colored stains and lacquers, burning and fine polishing. Prerequisite: W.W. 63. Two 3-hour labs. (3F)

Mortimer

*Where requirements for the lab. are met under another course, 3 credits for lecture only.

SCHOOL OF FOREST, RANGE, AND WILDLIFE MANAGEMENT

LEWIS M. TURNER, Dean

General Information	228
Forest Management	230
Range Management	234
Wildlife Management	237

General Information¹

THE favorable geographical location of this School of Forest, Range, and Wildlife Management, providing exceptional facilities for field experience, affords an excellent combination of circumstances and opportunities for effective training in the management of wild lands and their resources. Naturally-vegetated lands in Utah comprise more than 90 per cent of the total state area. The Cache National Forest, within two miles of school, the Bear River Migratory Bird Refuge within 40 miles, and vast areas of range lands provide forest, range, soil conservation, and wildlife problems; all offer study projects and opportunities for demonstration. Herds of elk and deer come within a short distance of the campus during the winter.

The Wildlife Management department is greatly enhanced through the establishment of a research agency of the U. S. Fish and Wildlife Service on the campus, which is housed in the forestry building. One of the fourteen Federal Wildlife Research Units, a cooperative project with the college, the Utah Fish and Game Department, the U. S. Fish and Wildlife Service, and the American Wildlife Institute is located here. Representatives of this agency assist in class and laboratory instruction, and aid in directing research of graduate students. Graduate fellowships in Wildlife Management have been made available through the Wildlife Research Unit.

The comparative newness of the fields of forestry, range, wildlife, soil conservation, watershed management, and forest recreation, and the unquestioned need for their correlation in permanent wild land management, present excellent opportunities for those desiring to participate in these fields of public service. The purpose stressed is the handling of wild lands so that they may be of continuing benefit for present and future generations of citizens.

RECOMMENDED ENTRANCE QUALIFICATIONS

Students entering the School of Forest, Range, and Wildlife Management will make more satisfactory progress if they have had high school algebra, chemistry, physics, typing, botany, zoology, and geometry. If the student has not had high school algebra or geometry, he will be required to make up these deficiencies in college. It is, therefore, recommended that these basic mathematics and science courses be taken in high school.

COURSES OF STUDY

The curricula of this school are designated to train men primarily for private, federal government or state work in (1) Forest Management, (2) Range Management, and (3) Wildlife Management. Forest management majors may choose between two options; one designed to train for general forestry work in the West, and one for strict timber management. The range majors may choose, in the junior year, to specialize in soil conservation and watershed management. Wildlife management majors may select a curriculum to train for general administrative work with big game and related problems, or a curriculum in general wildlife management with considerable emphasis on small game, or a curriculum in fishery management.

FIVE-YEAR CURRICULA RECOMMENDED

The efficient management of wild land resources in all its phases requires a broad fundamental knowledge of many of the sciences and arts. For this reason, many of the forest schools throughout the nation have recognized that the usual four-year program of study is inadequate to give the student sufficient training in both the basic sciences and in the technical subjects of the chosen field. It is therefore recommended that a five-year curriculum of study be pursued. The first two years of the regular four-year course of study are practically the same in all departments, with specialization in a major field beginning in

¹—For more detailed information request a copy of the School of Forest, Range, and Wildlife Management bulletin from the Dean of that school.

the third or junior year. This program gives the student a minimum of basic training and cultural foundation. The five-year program provides for an additional year devoted principally to general training in supporting arts and sciences. This furnishes a better foundation for the technical studies of the last two years and a superior cultural background which is desirable for advancement in public service.

SUMMER CAMP

The School has purchased and leased 3,000 acres of forest and range land approximately 22 miles from the campus within the Cache National Forest, where summer camp facilities have been established. Field instruction is required for graduation in addition to the regular 12 quarters of classroom work. Also, at least one summer season of field experience with a recognized conservation agency is expected of all students.

Attendance at the camp is required between the sophomore and junior years. The summer camp opens soon after the close of the spring quarter and continues for a period of 11 weeks. Sixteen credits are allowed for the complete program. In addition to the regular summer school fees, a \$5.00 fee is charged for each of the six courses, and board is provided on a cost basis. Students attending camp must be inoculated for Rocky Mountain spotted fever.

Students in other colleges or universities who wish to transfer to this school should consider carefully the following. Successful completion of all courses offered in the summer camp is (a) required for graduation in all three departments in the school, and (b) prerequisite to most of the professional courses in the Junior and Senior years. In planning a course of study for the junior and senior years transfer students should note in the description of courses those for which the summer camp training is prerequisite. It should be recognized that some transfer students coming to this school with two or more years of college work generally will be required to take more than two years to graduate.

Transfer students should also note that to be eligible to attend summer camp they should have completed two years of college work, essentially duplicating the courses required of freshmen and sophomores in this school. It is particularly important that they have had such courses as systematic botany and a field course in engineering surveying.

FIELD TRIPS

A schedule of field trips is planned each year as a part of the regular class instruction. In addition to short trips, scheduled for the individual courses, each department conducts an extensive field problems trip in the spring quarter, covering all branches of the major field. This trip is required of all seniors prior to graduation. The trip for wildlife majors is usually scheduled over the first week of May, and range majors over the second or third week. The trip for forestry majors is more extensive and covers a period of ten days or two weeks just prior to the end of the spring quarter. Each student pays his share of the cost of the trip. A fee of about \$35.00 is charged each student to defray the general expenses of the trip.

SCHOLARSHIP

A high standard of scholarship must be maintained by the student enrolled in forestry or the associated fields because of the technical nature of the work, the high professional standards, and the character of the Civil Service examinations that are required for federal service. A student is required to maintain a C or better average to remain in the school.

GENERAL REQUIREMENTS

The following general requirements must be met by all students graduating from the School of Forest, Range, and Wildlife Management.

- A. At least 210 credits (quarter hours) exclusive of basic Military Science and Physical Education.

- B. Sixteen of the 210 credits must be earned at Summer Camp.
 C. All courses prescribed under the study program of the chosen major.
 D. All of the following general requirements:
 1. English and Speech, 16 credits of which at least 3 must be Speech.
 2. Social Science, 8 credits, of which 5 are General Economics.
 3. Military Science or Physical Education—6 quarters.

All students must demonstrate proficiency in written and spoken English; any student showing marked deficiency will be required to pass successfully certain supplementary or corrective courses in addition to the requirement stated above.

BASIC COURSES

Required of all students majoring in the School of Forest, Range, and Wildlife Management.

Freshman				Sophomore			
Course				Course			
¹ Military Science 1, 2, 3.....	1	1	1	¹ Military Science 4, 5, 6	1	1	1
English 17, 18, 19	3	3	3	Botany 24, 25, 30	5	5	5
Chemistry 10, 11, 12	5	5	5	Civil Engineering 81, 80	3	2	—
² Mathematics 34, 35, 44	3	5	3	Physics 6	5	—	—
Speech 5	—	3	—	Agronomy 58	—	—	5
Forestry 1	3	—	—	Economics 51	—	5	—
³ Animal Husbandry 1	—	—	3	⁵ Geology 3	5	—	—
⁴ Animal Husbandry 2	—	—	2	⁶ Botany 120	—	—	5
Civil Engineering 60	—	1	—	⁷ Zoology 3, 4, 13	5	5	5
				⁸ Animal Husbandry 10	—	—	5

SUMMER CAMP

Required courses at summer camp:

Forestry 94	Forest Improvements	3
Forestry 95	Forest Surveying	3
Forestry 96	Camp Management	1
Forestry 97	Forest Practice	3
Range Management 98	Range Practice	3
Wildlife Management 99	Wildlife Practice	3

Senior College standing prerequisite to Junior and Senior College courses:

All students should note that Junior standing, that is, the equivalent of 90 quarter hours or 60 semester hours of college work, is prerequisite to all courses offered by the School of Forest, Range, and Wildlife Management except Forestry 1, and Forestry 10.

Forest Management

J. W. Floyd, Professor and Head of Department; Lewis M. Turner, T. W. Daniel, Professors; C. M. Bowen, R. R. Moore, Associate Professors.

Upon completion of either of the curricula prescribed below, students are granted the degree of Bachelor of Science in Forest Management. The courses are designed to give the student comprehensive training in all branches of for-

- 1—Not required of ex-military personnel.
- 2—Students presenting 1½ units of high school algebra or otherwise qualified to take Math. 35 are not required to take Math. 34.
- 3—Required only of students taking the general forestry option.
- 4—Required of range majors and students taking the general forestry option.
- 5—Required of forest and range management majors only.
- 6—Required in the sophomore year of forestry majors only.
- 7—Required of wildlife majors only.
- 8—Required of range majors excepting soil conservation students.

estry, including growing, protecting, harvesting and utilizing of timber crops. Two options are offered by this department. It is desirable that the student know by the end of his sophomore year which he will follow. The option in general forestry provides adequate training in timber management, and in addition some training is provided in range management, wildlife management, recreation, and watershed management. This type of curriculum is better adapted to the needs of the personnel of the public land managing agencies in the Intermountain region and, in fact, throughout most of the western states. The second option is timber management. This course provides major emphasis on the growing, harvesting, and utilizing of timber crops.

It is highly desirable that every student engage in field work related to forestry in the summer following the freshman and junior years. Students are urged to secure employment with such agencies as the U. S. Forest Service, Park Service, or comparable state agencies, or in private forest industries. The school maintains an employment service to aid students in securing such summer work.

Electives: Electives necessary to fill out the program of the Junior College years should be chosen with the object of improving the students' cultural as well as professional background. In the junior and senior years electives should be chosen with the object of broadening a specific field of study. Courses selected must meet the approval of the major professor.

The degree of Master of Science in Forest Management will be given upon completion of a prescribed course of study and fulfillment of other requirements listed by the Graduate School. Normally the student will be required to take all of the forestry courses in the two hundred series (See Description of Courses.) One to two years may be required depending on the ability of the student, the adequacy of his background, and his thesis problem. Applicants should submit an official transcript of their college courses.

Two teaching assistantships are available to graduate students in Forest Management.

FOREST MANAGEMENT

Freshman and Sophomore Years — See Basic Courses

A. General Forestry

Junior Year

Course:	Dept	Number			Credit		
		F	W	S	F	W	S
Forest Measurements I, II	Forestry		106	107		4	4
Dendrology I, II	Forestry	112	113		3	2	
Silviculture I, II	Forestry		114	115		3	3
Forest Protection	Forestry	118			3		
*Forest Protection II	Forestry			119			3
Public Land Administration	Forestry		132			3	3
Plant Ecology	Range	126			5		
Range Management	Range	162			5		
General Wildlife Management	Wildlife			150			5

Senior Year

Course:	Dept	Number			Credit		
		F	W	S	F	W	S
Forest Management	Forestry	121			4		
Forest Finance	Forestry		122			4	
Wood Technology	Forestry	126			3		
Forest Policy and Economics	Forestry		133			3	
Improvements and Recreation	Forestry			137			3
Forest Seminar	Forestry		142			2	
*Range Forage	Range		176			4	
*Watershed Management	Range	180			4		
*Junior English	English			112			4
Senior Field Problems	Forestry			146			3

1—English 111 may be substituted for English 112.

B. Timber Management

Students who choose the timber management option will substitute the following courses for those marked (*) above:

Course:	Dept	Number			Credit		
		F	W	S	F	W	S
Seeding and Planting	Forestry			116			2
Logging	Forestry	125			3		
Mechanical Properties	Forestry		129			2	
Milling and Products	Forestry			130			4
Forest Entomology	Zoology	105			3		
Forest Pathology	Botany		140			4	

Recommended electives for the general forestry option are Forestry 130, and for the timber management option, Forestry 117, Accounting 133, and Woodwork and Construction 67.

Description of Courses

1. General Forestry. A general survey of the professions of forest management, range management, soil conservation, recreation and wildlife management; character of the work; and relation of multiple uses of wild land to the welfare of the state and the nation. Open to all students. (3F and S) **Turner**

10. Forest and Range Conservation. An introduction to conservation problems designed to acquaint students with the nature and extent of the organic resources of the United States and methods of conserving them. Open to all students except School of Forestry majors. (2W) **Floyd**

11. Winter Woodcraft. Lectures and field trips are designed to train the student in the proper way of living in the wilderness. Prerequisite: ability to ski. The student must furnish ski boots and suitable outdoor clothing. Lecture, field trips. (3W) **Kelker**

94. Forest Improvements. Practical field problems in trail and telephone construction, the use of field radios, methods of fire prevention, detection and suppression. Care and use of woods, tools and horses in forest, range, and wildlife work. Problems in construction, planning recreational areas and water development. Interpretation of forest and range soil. Lab. fee \$5.00. Summer Camp. (3) **Floyd and Turner**

95. Camp Management. Planning and supervising the purchase of supplies, camp safety, camp sanitation and other camp management problems during forestry summer camp. Summer Camp. (1) **Bowen**

96. Forest Surveying. Practical field problems in surveying methods commonly employed in forest, range, and wildlife management. Type mapping. Lab. fee \$5.00. Summer Camp. (3) **Floyd and Daniel**

97. Forest Practice. Study of timber types and successional stages. Timber cruising, log scaling, inventories and growth of immature stands, stem analysis, taper measurements, sample plots, milling and utilization studies. Lab. fee \$5.00. Summer Camp. (3) **Bowen or Daniel**

101. Forest Survey I. Identification and range of the major commercial species of the United States. Elementary principles of silviculture and forest management. Not open to students in Forest Management. Prerequisite: Summer camp. (3F) **Daniel**

102. Forest Survey II. Forest improvement and recreation; log scaling, timber cruising, study of growth and yield; logging, milling, and seasoning of lumber. Some attention will also be given to identification, properties and uses of the major commercial woods of the United States and to the major wood products. Not open to students in Forest Management. Prerequisite: Summer camp. (3W) **Bowen**

106. Forest Measurements I. Measurements of timber in the log, the tree, and the stand. Log rules and volume tables. Timber cruising practices. Prerequisite, summer camp. (4W) **Bowen**

107. Forest Measurement II. Statistical methods useful in analyzing forest data. Volume and yield table compilation. Growth of even-aged, all-aged, and residual cut over stands. Prerequisite: For 106. (4S) **Bowen**

112. Dendrology I. Hardwoods. Identification, distribution, and silvics of the more important forest trees in the U. S. Prerequisite: Summer camp. (3F) **Daniel**

113. Dendrology II. Conifers. Identification, distribution and silvics of the more important forest trees in the U. S. Prerequisite: Summer camp. (2W) **Daniel**

114. Silviculture I. Characteristics of the tree species which influence the silviculture practice in the United States. Prerequisites: Summer camp; Range 126 and Botany 120. (3W) **Daniel**

115. Silviculture II. Silvicultural systems used in securing natural reproduction of forests and their applications to the important species and forest types in the United States. Prerequisite: For. 114. (3S) **Daniel**

116. Seeding and Planting. Seed collection, extraction and cleaning methods; germination testing; storage of forest tree seeds. Practical experience in field planting and nursery work. Prerequisite: For. 115. (2S) **Daniel**

117. Advanced Silvics and Silviculture. Growth, transpiration. Intensive study of a few major forest types. Prerequisite: For. 115. (3S) **Daniel**

118. Forest Protection I. Prevention, suppression and suppression of forest and range fires. Economics and physical effects. Prerequisite: Summer camp. (3F) **Floyd**

119. Forest Protection II. Problems of administration and economics in protecting forests from biological enemies. (3S) **Floyd**

121. Forest Management. Physical factors, influencing the regulation of a forest for sustained yield; site, growing stock and rotation. Compilation of data for management plans. Prerequisites: Summer camp; For. 106, 107, 115. (4F) **Moore**

122. Forest Finance. Financial aspects of forest management, such as land, growing stock and stumpage valuation, forest taxation and damage appraisal. Prerequisite: For. 121. (4W) **Moore**

125. Logging. Methods of handling timber from tree to mill in the various forest region. Prerequisite: Summer camp. (3F) **Moore**

126. Wood Technology. Structure and identification of the economic woods of the United States. (3F) **Bowen**

129. Mechanical Properties. A study of the factors affecting the strength of wood. (2W) **Bowen**

130. Milling and Products. Manufacturing, grading, seasoning, and preserving lumber, including a study of the wood using industries and their products. (4S) **Bowen**

132. Public Land Administration. History, organization and functions of conservation agencies affecting range, forest and wildlife administration. (3W) **Floyd**

133. Forest Policy and Economics. Development of Federal State and private forest policy. Economic problems in the production, distribution and consumption of forest products. Prerequisite: For. 132. (3W) **Floyd**

137. Improvements and Recreation. Roads, trails and structures necessary in forest management. Recreational use of forests and the classifications and development of areas suitable for this purpose. Prerequisite: Summer camp. (3S) **Floyd**

138. Recreational Planning. Mapping and designing plans for the various forms of forest recreational use. (3S) **Floyd**

142. Forestry Seminar. Review and discussion of current forestry problems and practices. (2W) **Moore**

145. Forest Problems. Individual study and research upon a selected forestry problem approved by the instructor. (1-3 F, W or S) **Staff**

146. Senior Field Problem. Study of forest operations. (3S) Senior year. Fee, \$35.00. **Staff**

201, 202, 23. Advanced Forestry Seminar. Review and discussion of more advanced current literature. For students in the graduate school. (1F, 1W, 1S) **Turner**

204. Forest Ecology. Study of the historical and present distribution of forest species and forest types and the physical-biological basis of distribution. (3W) **Turner**

205. Silviculture. Advanced treatment of silvics and silviculture with emphasis on the physiological aspects of the subjects. (3W) **Daniel**

206. Forest Management. Application of forest management principles; forest organization and development; forest regulation and sustained yield; management principles and control of operations. (2F) **Moore**

207. Forest Finance. Economic principles which control forestry enterprises; capital value of forest properties; cost of production in forest enterprises; determination of rate of profit; principles of appraising damages; stumpage valuation and forest taxation and insurance. (2W) **Moore**

208. Forest Measurements. Application of statistical measurement to forest problems. (3F) **Bowen**

209. Forest Economics. Study of economics of a private forest enterprise, including the economics of production, manufacture and marketing. (3F) **Floyd**

210. Forest Problems. Individual advanced study upon a selected forestry problem. (2-10 credits) **Staff**

211. Thesis. Original research on a problem in forest management to be concluded by preparation of a thesis. (10-15 credits) **Staff**

Range Management

L. A. Stoddart, Professor and Head of Department; **Arthur D. Smith**, Associate Professor; **C. Wayne Cook**, Associate Professor; **Max E. Robinson**, Assistant Professor; _____, Assistant Professor and Range Management Extension Specialist.

The curriculum in range management acquaints the student with methods of maintaining the production of native lands and methods of managing range livestock. An opportunity is given to take special instruction in soil conservation and watershed management.

The degree of Master of Science in Range Management will be granted upon completion of an arranged course of study. Students desiring this advanced work should obtain permission from the major professor at least twelve months before the degree is to be granted, at which time a program of research and study will be outlined. Adequate facilities are available to allow emphasis upon soil conservation, animal husbandry, botany, wildlife, economics, or agronomy. A bachelor's degree in range management or a related subject is prerequisite.

Several assistantships are available annually for students doing graduate work in range management. For information concerning these, prospective students should consult the department head.

COURSE OF STUDY

Freshman and Sophomore

Students majoring in range management will take the freshman and sophomore study program as outlined for the School of Forestry.

	Junior	F	W	S
*Botany 108	Agrostology	—	4	—
Range 126	Plant Ecology	—	—	5
Range 162	Range Management	5	—	—
Wildlife 150	General Wildlife Management	—	—	—
*Range 177	Forbs and Browse	3	—	—
*Range 179	Poisonous Plants	—	—	2
Forestry 132	Public Land Adm.	—	3	—
*A. H. 110, 125	Beef Production, Sheep Production	3	3	—
Botany 120	Plant Physiology	—	5	—

Suggested Electives

		F	W	S
Range 164	Advanced Range Management	—	3	—
*Range 181	Range Economics	—	3	—
Range 192, 193, 194	Range Seminar	1	1	1
¹ English 112	Junior English	—	—	4
*Forestry 101, 102	Forest Survey	3	3	—
Range 180	Watershed Management	4	—	—
Range 196	Senior Field Problems	—	—	1

Senior

		F	W	S
Agron. 113, 132	Applied Statistics	3	3	—
Agron. 114	Soil Survey and Land Classification	—	—	3
W. L. 155	Economic Wildlife	—	3	—
For. 118	Forest Protection I.	3	—	—
Agron. 103	Forage Crops	4	—	4
Ag. Econ. 106	Land Economics and Utilization	—	—	5
Vet. Sci. 120	Animal Hygiene	—	—	4
Agron. 155	Soil and Plant Relations	—	3	—
Bot. 121	Water Relations of Native Plants	—	3	—
Geol. 115	Adv. Physical Geology	5	—	—

MAJOR—SOIL CONSERVATION AND
WATERSHED MANAGEMENT

A major in soil conservation and watershed management is allowed with substitution of the following courses for those marked (*) above and for A.H. 10 in the Sophomore year.

		F	W	S
Agronomy 103	Forage Crops	—	—	4
Agronomy 125	Soil Conservation	—	—	3
Ag. Eng. 108	Eng. Aspects of Soil and Water Cons.	—	—	4
Geology 115	Advanced Physical Geology	5	—	—
C. Eng. 171	Hydrology	3	—	—
Range 176	Range Forage Plants	—	4	—
Botany 121	Water Relations of Native Plants	—	3	—
Agronomy 114	Soil Survey and Land Classification	—	—	3
Agronomy 155	Soil and Plant Relations	—	3	—

MINOR—RANGE MANAGEMENT

The following courses are suggested for students wishing to minor in Range Management. The requirements are subject to change upon approval of the department head.

Range 126	Plant Ecology	5 credits
Range 160	Principles of Managing Range Lands	5 "
Range 176	Range Forage Plants	4 "
Range 181	Range Economics	3 "
Range 192, 193, 194	Range Seminar	3 "

1—English 111 may be substituted for English 112.

Description of Courses

- 98. Range Practice.** Field work in range management involving training in making range reconnaissance, estimating utilization, conducting technical range research, range improvement and management planning. Lab. fee \$5.00. Summer camp. (3) **Smith**
- 126. Plant Ecology.** An analysis of habitat factors as they influence plant growth and distribution. Attention will be given to plant succession and competition and to detailed methods of studying and mapping vegetation. Prerequisites: Botany 30; Agronomy 56 or 58. (5F or S) **Stoddard**
- 160. Principles of Managing Range Lands.** A general course designed to give students not majoring in the field a knowledge of how to evaluate, increase, and perpetuate range. Field trips and laboratory work on range plants. Credit not allowed students having credit in R.M. 162. Prerequisite: Botany 25 or Botany 12. Four lectures, one lab. (5S) **Cook**
- 162. Range Management.** A course dealing with problems met in managing native range lands; revegetation of range lands; maintenance of production; utilization of range forage; and range livestock management. Prerequisites: Botany 30 and Range 98. (5F or S) **Cook**
- 164. Advanced Range.** Technical problems in range management. Prerequisites: Range 126 and 162. (3W) **Stoddard**
- 176. Range Forage Plants.** Native forage plants, including poisonous plants, their identification, distribution, ecology, and economic value. Prerequisite: Botany 30. (4W) **Cook**
- 177. Forbs and Browse.** A study of forbs and browse including identification, region of growth, habitat, and forage value. Prerequisite: Botany 30. (3F) **Cook**
- 179. Poisonous Plants.** A study of important poisonous plants, including general methods of livestock handling and range management practices, identification, region of growth, habitat, poisoning symptoms, remedies and control measures. Prerequisite: Botany 30. One lecture, one lab. (2S) **Cook**
- 180. Watershed Management.** The study of floods, soil erosion and runoff on range and forest lands, the effects of vegetation in equalizing runoff and preventing erosion and methods of rehabilitating damaged watersheds. Prerequisite: Range 126. (4F) **Smith**
- 181. Range Economics.** Development of the range industry, cost of production, range land utilization, organization of cattle and sheep industry, and value of range forage. Prerequisite: Range 162. (3W) **Smith**
- 192, 193, 194. Range Seminar.** A systematic review of the field of range management and related fields. Prerequisite: Range 162. (1F, 1W, 1S) **Staff**
- 195. Range Problems.** Individual study and research upon a selected range problem. (1-3 F, W or S) **Staff**
- 196. Senior Field Problems.** Field study of range management operations and research. (3S) Fee, \$30.00. **Smith**
- 200. Thesis.** Original research and study on a problem in range management. This course is open only to graduate students. (1-15 F, W or S) **Staff**
- 204, 205. Graduate Seminar.** Current scientific papers in range management, and an analysis of range problems in foreign countries. Not open to undergraduate students. (1F, 1W) **Smith**
- 206. Research Methods.** A study of research methods in range management and related subjects. (2W) **Stoddard**
- 281. Advanced Range Economics.** Advanced study of economics of various systems of range management, range seeding, land operation, and livestock management. Prerequisite: Range 181. (2S) **Smith**

282. Vegetation Influences. Advanced study of the influences of vegetation upon the hydrological cycle, influence of vegetation on percolation of ground waters, runoff and the regiment of streams. Prerequisite: Range 180. (2W) **Smith**

Wildlife Management

G. H. Keller, Professor and Head of Department; **J. B. Low**, Professor and Biologist, U. S. Fish and Wildlife Service; **W. F. Sigler**, Associate Professor.

Upon completion of the basic courses and the upper division requirements as outlined in the study program, students are granted the degree of Bachelor of Science, major in Wildlife Management. The basic courses of the freshman and sophomore years as tabulated on page 230. Prospective wildlife management majors should elect Zoology 3, 4, and 13 in the sophomore year.

The course work of the junior year provides comprehensive basic training in general wildlife management. Those having an interest in a particular field may choose one of three options to be completed in the senior year. The option in management of big game stresses the economic and ecological relationships of large mammals to forest and range, with emphasis on western conditions. The second option, featuring small game and furbearers, considers representative areas of the United States for illustrative purposes in the management of each game bird or mammal. Attention is given to game farm procedures. The fisheries option considers the production of both cold water and warm water fish in relation to local land uses. Land utilization often affects seriously the water habitat. Thus training is given in survey work of the water and the land from which it drains. In addition to the general training, the student participates in creel censuses, measuring the growth rate and productivity of fish in inland waters, and in various forms of habitat improvement.

Any one of these programs trains students for both general administrative and investigative work with state and federal agencies.

Graduate standing is required in order to take courses numbered over 200.

Upon completion of a prescribed course and fulfillment of the requirements as listed by the Graduate School a Master of Science or Doctor of Philosophy degree in Wildlife Management is given. A period of one to three or more years, depending upon the thesis problem and the amount of time which the student can devote to his studies, is necessary to complete all requirements for the degrees. Prerequisite to graduate work is a bachelor's degree in Wildlife Management, or a related field.

Through the cooperation of the Fish and Wildlife Service of the U. S. Department of Interior, the Utah State Fish and Game Department, the Wildlife Management Institute, and the College, one of the cooperatively sponsored Wildlife Research Units was established at Utah State Agricultural College in 1935.

Wildlife Research Unit funds are available for four or more graduate research fellowships for students working toward a master's degree in this field. Candidates for fellowships will be chosen from applicants who have a bachelor's degree in Wildlife Management or a related field from a college of recognized standing, and who submit formal application with transcript of college credits and references on or before April 1.

COURSE OF STUDY

Freshman and Sophomore — see Basic Courses for
Forest, Range, and Wildlife Management.

Wildlife Management

Junior Year

List of courses required for graduation of all Wildlife Majors.

		F	W	S
Wildlife 145	Principles of Wildlife Mgt.	3	—	—
Wildlife 157, 158, 159	Seminars	1	1	1
Wildlife 160	Animal Ecology	3	—	—
Wildlife 171	Field Problems	—	—	1
Wildlife 172	Problem Orientation	—	2	—
Wildlife 175	Wildlife Law Enforcement	—	3	—
Zoology 122, 121	Mammalogy, Ornithology	—	4	4
Zoology 155	Ichthyology	—	4	—
Range 126	Plant Ecology	—	—	5
Agronomy 131, 132	Applied Statistics	3	3	—
English 112 ¹	Junior English	—	—	4

Senior Year

The student must complete all course work in any one of the three options to meet the requirements for graduation. He may choose suitable electives from the other two groups to broaden his training.

A. Big Game Management:

Wildlife 153	Management of Big Game	—	5	—
Wildlife 146	Management of Upland Game	—	—	3
Wildlife 171	Field Problems	—	—	—
Forestry 101, 102	Forest Survey	3	3	—
Range 162	Range Management	5	—	—
Range 176	Range Forage Plants	—	4	—
Range 180	Watershed Management	4	—	—

B. Small Game and Furbearer Management:

Wildlife 146	Management of Upland Game	—	—	3
Wildlife 147	Mgt. of Waterfowl and Furbearers	—	—	5
Wildlife 171	Field Problems	—	—	—
Wildlife 161	Limnology	3	—	—
Bot. 112	Aquatic and Marsh Plants	3	—	—
Range 162	Range Management	5	—	—
Bot. 108	Agrostology	—	4	—
An. Hus. 20	Fur-farming	—	2	—
Poultry Hus. 104	Incubation and Brooding	—	—	2

C. Fishery Management:

Wildlife 165	Fishery Management	—	—	3
Wildlife 169	Techniques in Fishery Mgt.	—	3	—
Wildlife 161	Limnology	3	—	—
Wildlife 147	Mgt. of Waterfowl and Furbearers	—	—	5
Bot. 112	Aquatic and Marsh Plants	3	—	—
Range 180	Watershed Management	4	—	—

¹—English 111 may be substituted for English 112.

Description of Courses

99. Wildlife Practice. Lake and stream surveys and mapping for improvement purposes and for restocking; the use of census methods for big game, game birds, and rodents; cover mapping; preparation of animal skins, and study of deer and elk ranges. Summer camp. (3) **Kelker and Sigler**

145. Principles of Wildlife Management. Properties of animals and their habitats in relation to general management practices. Field trips. Prerequisite: summer camp. (3F) **Kelker**

146, 246. Management of Upland Game. Taxonomy, life histories, distribution, environment needs, enemies, and plans for management of game birds and small mammals. Prerequisite for W. 146; Wildlife 99 and 145. Additional work required of graduate students. Fee \$20.00. (3S) **Sigler**

147, 247. Management of Waterfowl and Furbearers. Taxonomy, life histories, habitat requirements, economic importance, and plans for management of waterfowl and fur-bearers, especially the muskrat and beaver. Prerequisite for W. 147; Wildlife 99 and 145. Additional work required of graduate students. (5S) **Kelker**

150. General Wildlife Management. Principles of animal ecology and wildlife management; life histories, ecology, economics and management phases of important species of big game, upland game, waterfowl, and fish. No credit allowed wildlife majors. Field trips arranged. (5F or S) **Kelker**

153, 253. Management of Big Game. Life histories, distribution, numerical variation, enemies, and plans for management of native big game animals. Prerequisite for Wildlife 153, 99 and 145. A term paper required of those doing graduate work. (5W) **Kelker**

155. Economic Wildlife. General importance of wildlife resource; natural history, economic values and control methods for rodents and predators; identification of skulls and skins; a brief evaluation of hawks and reptiles. Particularly adapted for students in forestry, range and agriculture. (3W) Not offered 1949-50. **Kelker**

157, 158, 159. Wildlife Seminar. Discussion of current developments in Wildlife management. (1F, 1W, 1S) **Staff**

160, 260. Animal Ecology. Distribution and behavior of animals as affected by various environmental factors. Special attention to inter-relationships of biotic communities. (3S) **Kelker**

161. Limnology. Physical, chemical, and biological factors affecting occurrence and productivity of fishes and other aquatic animals in fresh waters. Prerequisite: Bot. 30 and Zool. 13. (3F) **Sigler**

165, 265. Fishery Management. Principles of lake, pond, and stream improvements; food and spawning habits of game fishes, propagation methods, and common fish diseases. Prerequisite: Zool. 155 and Wildlife 99. Fee \$20. (3S) **Sigler**

169. Techniques in Fishery Management. The mechanics of collecting and analyzing life history material of fishes. Prerequisite: Zool. 155, Wildlife 99 and 161. (3W) **Sigler**

170. Wildlife Problems. Individual study and research upon a selected wildlife problem approved by the instructor. Prerequisite: Wildlife 172. (1-3 F, W, or S) **Staff**

171. Field Problems. Study of wildlife management operations by various agencies of the Intermountain country. Fee, \$20. (3S) **Kelker**

172. Problem Orientation. A discussion of needs and approach to wildlife investigations: analyzing the problem, presenting data, and drawing conclusions relative to research in wildlife management. (2W) **Kelker**

175. Wildlife Law Enforcement. Review of state and federal regulations of sh and game; discussion of apprehension of violators; collection of evidence, and its use in the court. (3W) Not given 1950-51) **Sigler**

257. Graduate Seminar. Study of logic and the scientific method with special reference to wildlife investigations. (2F) **Kelker**

258. Graduate Seminar. Discussion of current investigations by class members and by representatives of state and federal agencies. (2W) **Low**

259. Graduate Seminar. Review of current literature pertaining to the completion and publication of technical papers. (2S) **Sigler**

263. Marsh Management. Marshland restoration and maintenance for waterfowl and aquatic furbearers; economic returns from marshlands; ecological plant succession and methods of restoration and maintenance of plant food and cover; management of public and private waterfowl shooting grounds; evaluation and control of predation and sickness; water level manipulation and controls for year-round operations of marshlands. (3S) **Low**

270. Advanced Wildlife Problems. Research problem chosen, the project outlined and planned, and data collected by the student qualified for investigations in Wildlife Management. (5-10 F, W or S) **Staff**

272. Wildlife Thesis. Analysis, presentation, and interpretation of field data for the graduate thesis. Prerequisite: Wildlife 270. (5-10 F, W or S) **Staff**

SCHOOL OF HOME ECONOMICS

ETHELYN O. GREAVES, Dean

General Information	242
Curricula in Home Economics	243
Child Development and Parent Education.....	249
Clothing, Textiles, and Related Arts	250
Foods and Nutrition	253
Household Administration	255
Home Economics Education	255

General Information

All Home Economics courses are intended primarily to prepare young women for homemaking. Admission to the School of Home Economics requires completion of 15 high school units of work including the following: English, three units; algebra, one unit; social science, one unit; natural science (requiring laboratory work), one unit; elected (from the above groups and modern languages), three units.

The function of homemaking takes in all areas in Home Economics. For this reason courses are planned to prepare young women to carry the knowledge and skills of expert homemaking into various institutions of complex modern society. Accordingly, students may elect majors leading to a Bachelor Degree in the following divisions of Home Economics:

**CHILD DEVELOPMENT AND PARENT EDUCATION
CLOTHING, TEXTILES AND RELATED ARTS
FOODS AND NUTRITION
HOUSEHOLD ADMINISTRATION
HOME ECONOMICS EDUCATION**

The chief professional opportunities open to majors in the School of Home Economics are (1) Child Development and Parent Education; Elementary Education; Research; Institutional Management; Teaching. (3) Clothing, Textiles and Related Arts; Merchandising; Management; Teaching; Costume Design Textile Research. (4) Household Administration; Homemaking. (5) Home Economics Education; Teaching; Homemaking, Extension Service.

A two-year terminal course in Home Economics subjects is offered for persons who are unable to complete a four-year course but who would profit from the pursuit of practical homemaking study.

In the first two years, students of Home Economics register for courses that will satisfy college requirements for graduation.

For the convenience of students these requirements are here summarized:

Lower Division Requirements

1. Biological Science	8-12 credits
2. Physical Science	8-12 "
3. Language and Arts	8-12 "
4. Social Science	8-12 "
<hr/>	
Total	40 credits
5. Six quarters of Physical Education	
6. Sophomore Composition (English 10 or 11).	

All freshmen registering in the School of Home Economics and students transferring from junior college who do not have credit for a similar course are required to register for Home Economics Survey 10. This course deals with the orientation of the student into Home Economics and her guidance in the choice of a vocation related to this field. Open to all College women. One credit. Fall, Th. 11. **Staff**

TWO-YEAR TERMINAL COURSE IN HOME ECONOMICS

A two-year terminal course in home economics is offered for students who, for any reason, do not expect to complete any of the four-year majors in the homemaking group. The course is so planned, however, that students may without undue delay, complete later the work required for a four-year course.

While the course offers a broad foundation in homemaking, it also makes possible a concentration of effort on phases of home economics that will prepare the student for employment in specific fields.

REQUIREMENTS FOR TWO-YEAR TERMINAL COURSE

1. Complete a major of 30 credits in one or more closely related departments of the School of Home Economics.

2. Complete a minor of 15 credits related to or basic to the major field—not necessarily in the School of Home Economics.
3. Twenty-four credits in basic groups:
 - a. Language 9 credits
 - b. Exact Science 5 "
 - c. Biological Science 5 "
 - d. Social Science 5 "
4. Electives—21 credits.
5. Physical Education—6 credits.

CURRICULA IN HOME ECONOMICS

CHILD DEVELOPMENT AND PARENT EDUCATION

Freshman Year

Home Economics	Credit	Quarter		
C. T. & R. A. 9 (1)	3	F	W	S
H. E. 10 (1)	1	F	—	—
F. & N. 5 (1)	3	F	W	S
F. & N. 24 (1)	3	F	W	S
C. D. 70	3	F	W	F
Group Requirements (2) (3) (p.)	20	F	W	S
Other College Requirements (p.)				
Physical Education	3	F	W	S
Other Requirements on C. D. Major p.				
English 24	4	F	W	S
Electives (4)	8 or 9	F	W	S
<hr/>				
48 or 49				

Sophomore Year

Home Economics	Credit	Quarter		
C. D. 60	5	F	W	S
H. Ad. 65 (1)	3	—	W	S
C. T. & R. A. 55	3	—	—	S
F. & N. 25	3	—	—	S
Sociology 60	4	F	W	S
Group Requirements (2) (3) (p. 47)	20	F	W	S
Other College Requirements (p. 47-48)				
English 10	5	F	W	S
Physical Education	3	F	W	S
Electives (4)	5	F	W	S
<hr/>				
51				

- (1) Suggested for the required 18 credits of General Home Economics.
- (2) Prerequisites: Art 1, 2; Music 4, 5; Psychology 53.
- (3) Group requirement recommendation: Physiology 4; Bacteriology 1; Physics 1; Sociology 10 or 70; Geology 1; Economics 51, 52.
- (4) Elective recommendations: Speech 18; Child Development 176; Woodwork 74.

Junior Year

Other College Requirements (p. 47-49)	Credit	Quarter		
English 110	4	F	W	S
Other Requirements, C. D. Major				
Psych. 105	3	F	—	S
Zool. 111	4	F	W	—
Certification Requirements (p. 51)				
Bact. 155	3	—	W	S
Psych. 108 (5)	3	—	W	—
Ed. 103	4	F	W	S
Ed. 104	3	F	W	S
Ed. 114	3	F	W	—
Home Economics				
C. T. & R. A. 24 or 27 (1)	3	F	W	S
Electives (4)	18	F	W	S

UTAH STATE AGRICULTURAL COLLEGE

Senior Year

Home Economics	Credit	Quarter		
C. D. 174 and 175	7	F	W	S
C. D. 138	5	—	—	S
C.D. 190	1	—	—	S
Certification Requirements				
Ed. 105	3	F	W	S
Ed. 106	12	F	W	S
Education Electives	2-3	F	W	S
Electives (4)	18	F	W	S
	48			

- (1) Suggested for 18 credits of general Home Economics.
 (4) Elective Recommendations: Speech 18; Child Development 176; Wood-work 74; Sociology 160; C T. & R. A. 33, C. T. & R. A. 115.
 (5) Recommended to fill required 45 credits for Certification.

CLOTHING, TEXTILES AND RELATED ARTS

Freshman Year

Home Economics	Credit	Quarter		
C. T. & R. A. 5	2	F	W	S
C. T. & R. A. 6	3	F	W	S
C. T. & R. A. 24	2	F	W	S
H. E. 10 (1)	1	F	—	—
F. & N. 5 (1)	3	F	W	S
C. D. 70 (1)	3	F	W	S
Group Requirements (2) (p. 47)	16	F	W	S
Other College Requirements (p. 47-48)				
Physical Education	3	F	W	S
Art Requirements				
Art 1	3	F	W	S
Art 2	3	F	W	S
Art 3	3	F	W	S
Electives (3)	10	F	W	S
	51			

Sophomore Year

Home Economics	Credit	Quarter		
C. T. & R. A. 25	3	F	W	S
F. & N. 24 (1)	5	F	W	S
C. D. 60 (1)	5	F	W	S
Group Requirements	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
Art Requirements				
Art 32	3	—	—	S
Art Electives	3	F	W	S
Electives (3)	5	F	W	S
	50			

- (1) Suggested for the required 10 credits of Home Economics in addition to the major.
 (2) Group requirement recommendations: Botany 1 or Zoology 1; Physiology 4; Bacteriology 1, 2; Psychology 53, Economics 51; Chemistry 10, 11, 12; Sociology 10, 70; Speech 1; History 4; World Literature 40.
 (3) Elective recommendations: Clothing, Textiles and Related Art 33; Consumer Education 50; Housing Problems 65; Landscape Architecture 3; Radio Speech 81; Music 80, 81; French Foods and Nutrition 25.

SCHOOL OF HOME ECONOMICS

245

Junior Year

Home Economics	Credit	Quarter		
C. T. & R. A. 105	3	F	—	—
C. T. & R. A. 115	3	F	W	—
C. T. & R. A. 140	3	—	W	—
C. T. & R. A. 133	3	—	W	S
C. T. & R. A. 165	3	F	—	S
Other College Requirements				
English 110	4	F	W	S
Art Requirements				
Art Electives	5	F	—	S
Electives (3)	27	F	W	S
	51			

Senior Year

Home Economics	Credit	Quarter		
C. T. & R. A. 125	3	—	W	S
C. T. & R. A. 170	3	—	—	S
C. T. & R. A. 185	5	F	—	S
C. T. & R. A. 191	2	F	—	—
C. T. & R. A. 175*	36	F	W	S
	51			

(3) Elective recommendations: C. T. & R. A. 200; H. Ad. 49, 150; Physics 1; Political Science 101, 102, 110; Journalism; Literature; Art 104.

FOODS AND NUTRITION

Freshman Year

Home Economics	Credit	Quarter		
H. E. 10 (required)	1	F	—	—
C. T. & R. A. 9 (1)	3	F	W	S
C. D. & P. E. 70 (1)	3	F	W	S
H. A. 50	3	F	W	S
Group Requirements (Page 47-48) (2)	28	F	W	S
Other College Requirements				
Physical Education	3	F	W	S
Electives (3)	7	F	W	S
	48			

Sophomore Year

Home Economics	Credit	Quarter		
C. T. & R. A. 24 (1)	3	F	W	S
F. & N. 24	4	F	W	—
F. & N. 25	4	—	W	S
C. D. 60	5	F	W	S
Group Requirements				
Chemistry 10, 11, 12	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
Electives (3)	9	F	W	S
	48			

*Alternate years given in 1950-51.

- (1) Recommended for the Home Economics requirements of 18 hours in the various departments within the School.
- (2) Recommended for group requirements: Physiology 4 and 5; Bacteriology and Public Health 1 and 2; Economics 5; Sociology 70; Speech 1; English 2. Note: (The first four courses listed are required of majors in Institutional Management.)
- (3) Recommended for Electives: Psychology 53; Mathematics 34 or 35; Clothing, Textiles and Related Arts 25 and/or 27; Agricultural Economics and Marketing 62; Household Administration 49, 65; Art 1 and 2; Speech 81; Physics 1; Typewriting; Physiology 11; Vegetable Crops 1; Sociology 60.

Junior Year

Home Economics	Credit	Quarter		
F. & N. 107	3	—	—	S
F. & N. 180	5	—	W	—
Chemistry				
Biochemistry	5	F	—	—
Other College Requirements				
English	4	F	W	S
Required for majors in Inst. Mgt.				
Psychology 102a and b	5	F	—	S
Education 120	3	F	—	S
Business Administration 100	3	—	W	—
Electives (3)	15	F	W	S
	<hr/> 48			

Senior Year

Home Economics	Credit	Quarter		
F. & N. 140 and 141	6	—	W	S
F. & N. 145	4	—	—	S
F. & N. 191	3	—	—	S
Requirements for Majors in Inst. Mgt.				
F. & N. 182	3	—	—	F
F. & N. 183	3	—	—	S
Electives (3)	19	F	W	S
	<hr/> 44			

- (3) Elective Recommendations; Journalism 112, 113, 114; Education 121, 121b; Bacteriology and Public Health 120; Foods and Nutrition 144; Household Administration 149; Business Administration 55; Economics 28.

HOUSEHOLD ADMINISTRATION**Freshman Year**

Home Economics	Credit	Quarter		
H. E. 10	1	F	—	—
F. & N. 5	3	F	W	S
F. & N. 24, 25	3	F	W	S
C. T. & R. A. 9	3	F	W	S
Group Requirements (1) Page 47)	15	F	W	S
Physics 1	5	F	W	S
Other College Requirements (p. 47-48)				
Physical Education	3	F	W	S
Art Requirements				
Art 3	3	F	W	S
Electives (2)	12	F	W	S
	<hr/> 48			

Sophomore Year

Home Economics	Credit	Quarter		
H. Ad. 65	3	—	W	S
C. T. & R. A. 24	4	F	W	S
C. T. & R. A. 33	5	F	W	S
C. D. 60	5	F	W	S
Group Requirements (1) (Page 47)	15	F	W	S
Econ. 51	5	F	W	S
Other College Requirements				
Eng. 10	5	F	W	S
Physical Education	3	F	W	S
Electives (2)	5	F	W	S
	48			

- (1) Group requirement recommendations: Physiology 4; Psychology 53; Sociology 70; Speech 1; History 4; Political Science 1; Art 1, 2 Misc. 1, 80, 81.
 (2) Elective recommendations: Landscape Architecture 3; Sociology 60; Foods and Nutrition 35; English 24; Music 38; Journalism 15; Household Administration 50.

Junior Year

Home Economics	Credit	Quarter		
H. Ad. 149	3	F	W	—
C. T. & R. A. 55	3	—	—	S*
C. D. 70	3	F	W	S
Electives (2)	36	F	W	S
	48			

Senior Year

Home Economics	Credit	Quarter		
H. Ad. 150	3	F	W	S
Art Requirements				
Art 123	5	F	—	S
Other College Requirements				
Eng. 110	4	F	W	S
Electives (2)	36	F	W	S
	48			

- (2) Elective recommendations: Zoology 111; Art 114.

HOME ECONOMICS EDUCATION CURRICULA

The following professional program prepares graduates for teaching in the field of home and family living. It certifies graduates to teach any and all phases of home economics in the schools of Utah, including high schools having George-Barden (vocational homemaking).

It is important that students register with the instructor for Education 121 and 122 two quarters before they plan to do their student teaching. This provides the time necessary to obtain cooperation of schools to provide enough teaching assignments for those registering in these courses.

Freshman Year

Home Economics	Credit	Quarter		
C. D. 70	3	F	W	S
C. T. and R. A. 9	3	F	W	S
H. H. Management 50	3	F	W	S
H. E. 10	1	F	—	—
Group Requirements (1) (2) (Page...)	31	F	W	S
Other College Requirements (Pages...)				
Physical Education	3	F	W	S
Electives (3)	4	F	W	S
	48			

- (1) Prerequisites: Art 1, 2; Chemistry 10, 11, 12; Psychology 53.
- (2) Group requirement recommendations: Bacteriology 1 and 2; Economics 51 or Agricultural Economics 62; English 24; Music 1; Physiology 4; Speech 1; History, Literature, Political Science, Sociology.
- (3) Elective recommendations: Students are advised to consider:
 - a. Developing a field of interest into a teaching minor, i.e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts Foods and Nutrition.
 - b. Developing understanding of cultural, social, and economic problems through Art; Economics; Music; History; Political Science; Sociology.

Sophomore Year

Home Economics	Credit	Quarter		
C. D. 60	5	F	W	S
C. T. and R. A. 24	3	F	W	S
C. T. and R. A. 25	3	F	W	S
F. and N. 24	4	F	W	—
F. and N. 25	4	—	W	S
C. T. and R. A. 33	3	F	W	S
H. Ad. 65	3	—	W	S
Group Requirements (1) (2)	15	F	W	S
Other College Requirements				
English 10	5	F	W	S
Physical Education	3	F	W	S
	<hr/> 48			

Junior Year

Home Economics	Credit	Quarter		
C. T. and R. A. 115	3	F	W	—
F. and N. 100		—	—	S
H. Ad. 149	3	F	W	—
Soc. 60	4	F	W	S
Other College Requirements				
English 110	4	F	W	S
Education				
Ed. 114	3	F	W	—
Ed. 120	3	F	—	S
Public Health 155	3	F	W	S
Psy. 102	5	F	—	S
Electives (3)	18			
	<hr/> 48			

- (1) Prerequisites: Art 1, 2; Chemistry 10, 11, 12; Psychology 53.
- (2) Group requirement recommendations: Bacteriology 1 and 2; Economics 51 or Agricultural Economics 62; English 24; Music 1; Physiology 4; Speech 1; History, Literature, Political Science, Sociology.
- (3) Elective recommendations: Students are advised to consider:
 - a. Developing a field of interest into a teaching minor, i.e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development; Clothing, Textiles and Related Arts; Foods and Nutrition.
 - b. Developing understanding of cultural, social, and economic problems through Art, Economics, Music, History, Political Science, Sociology.

Senior Year

Home Economics	Credit	Quarter		
C. T. and R. A. 185	3	F	—	S
F. and N. 142	4	—	—	S
H. Ad. 150	3	F	—	S
Electives	4	—	—	—
Education				
Ed. 121	4	—	W	S
Ed. 122	8	—	W	—
Courses to complete requirements for professional education may be elected. (Check with major professor in order to be sure requirements for certification are being met.)				
Electives (3)	14			
	48			

(3) Elective recommendations: Students are advised to consider:

- α. Developing a field of interest into a teaching minor, i.e., Art; Commerce; English; Music; Physical Education; Social Science; Child Development Clothing, Textiles and Related Arts; Foods and Nutrition.

EXTENSION SERVICE CURRICULA

Requirements for student entering the field of Agricultural Extension Service as County Home Demonstration Agents:

Complete the Home Economic Education Curricula as outlined and in addition:

Journalism	4 or 12
Public Speaking	4 or 5
Sociology	141
Foods and Nutrition	146
Extension Methods	151

A three-month training period in a county under supervision is required of prospective Home Demonstration Agents. Plans for the training are made with Director of Extension Service.

Child Development and Parent Education

Helen L. Porter, Assistant Professor; Oral Pugmire, Marion Aikin, Instructors.

Students majoring in Child Development and Parent Education must complete 36 hours including the following required courses: Child Development 60, 70, 174, and 175; Foods 25; Clothing Textiles and Related Arts 55; Speech 18 or English 24; Psychology 105; Zoology 111. The remaining hours may be selected by the student from the approved courses listed below, in conference with the major advisor: Child Development 138, 190; Household Administration 49, 50, 149 and 150; Woodwork 74; Foods 146; Sociology 60; Psychology 123 and 145.

All students graduating from Home Economics department are required to have 18 hours of Home Economics in addition to those required in the major. These should be selected as representative subjects in Foods and Nutrition, Clothing, Textiles and Related Arts and Household Administration.

A minor in Child Development should include Child Development 60, 70, 175, A and B and Foods 25.

Students expecting to teach in nursery school, kindergarten or the elementary grades must meet the state requirements for certification. It is recommended that they adopt a major in Child Development and a major in Elementary Education. These majors relieve the students of all requirements for a minor. Heads

of both Education and Child Development Departments should be consulted if this plan is followed.

60. Child Development and Guidance. To acquaint teachers, homemakers, social workers, and any others interested in working with children with some of the fundamentals of child growth and development, and to help them to develop a philosophy of guidance. Each of the following hours: 9, 10, 11, 12, 1, 2, 3, should be free once during the week to allow for scheduling three laboratory hours for observation in the nursery school. Students who can free all but one of these hours should consult the instructor before registering. Open to students of sophomore standing or above. Fall, Winter and Spring quarters. (5F, W or S) **Staff**

61. Child Guidance. Required of all home economics transfer students who have had only two or three credits in child study. One credit is earned by three hours of observation weekly in the nursery school. (See Child Development 60.) (2F or W) **Staff**

70. The Health of the Family. The anatomy and physiology of the reproductive system, preparation for motherhood, and the physical care of mother and child from the prenatal period to the end of the first year of the child's life. (3F, W or S) **Staff**

138. Survey in Child Development. The history of the child development movement, present agencies and programs operating to further the welfare of children; nursery school administration, a two hour nursery school teaching laboratory weekly. Recommended for all majors, spring quarter of junior year. Open to Child Development majors only. (SS) **Porter**

140. Special Problems in Child Development. For qualified students majoring in Child Development, upon consultation with instructor. Any quarter. Time and credit arranged. **Staff**

174. Nursery School Methods. This must parallel 175. Study and collection of materials used in nursery school teaching, such as stories, pictures. Special consideration to understanding the needs of individual children in the Nursery School and evaluation of procedures used in guiding them. (2F, W or S) **Porter and Pugmire**

175. Practice Teaching in the Nursery School. An opportunity to apply the principles of child guidance in the nursery school. Open only to Child Development majors and minors. Prerequisites: C.D. 60 and 70. (5) **Staff**

176. Advanced Practice Teaching in the Nursery School. A continuation of Child Development 175; an additional opportunity to work with young children. One conference weekly with instructor. Open only to Child Development majors. Prerequisite: C.D. 175. (4-6F, W or S)

190. Seminar in Child Development. Discussions and reports of current readings in Child Development. Open only to Child Development majors. (1S) **Staff**

Clothing, Textiles, and Related Arts

Bertha F. Johnson, Professor; **Florence Gilmore**, Assistant Professor; **Rhea Hurst**, Assistant Professor, Extension Home Furnishings Specialist; **Mignon Perry**, **Jean Dance**, Instructors; **Theta Johnson**, Assistant Professor, Clothing.

Effie Barrows, Professor Emeritus.

Students who elect Clothing, Textiles and Related Arts as their major are required to complete the following courses: Clothing 5, 6, 24, 25, 27, 105, 115, 125, 133, 140, 165, 170 175 185 191; 18 credit hours in the art department to include Art 1 2, 3, 32 with the additional hours in 111, craft or studio classes.

The Clothing, Textile and Related Art Department in cooperation with other departments offers majors and minors in the following fields: Costume Design, Textile Research, Teaching of Clothing and Textiles, and Home Decoration.

Recommended courses to complete these majors and minors are as follows:

Fashion Merchandising

CT&RA 5, 6, 24, 25, 27, 105, 115, 125, 140, 165, 170, 185, 191 175. Bus. Ad. 20, 62, 63, 109, 149, 151, 152, 153, 156; Psy. 155; Art 1, 2, 3, 32, 110 and other art courses to complete a minor. To fill group requirements: Econ. 51.

Merchandise Majors with Minors in CT&RA

CT&RA 5 or 15, 24, 27, 105, 115, 140, 175, 191; H. Ad. 50, and one course in construction for women.

Costume Design

CT&RA 5, 6, 24, 25, 27, 105, 115, 140, 165, 170, 175, 185, 191, 200; Art 1, 2, 3, 7, 10, 32, 111 and additional craft classes to complete a minor.

Education

Majors in Clothing and Textiles who desire to teach in secondary schools should complete a double major of Vocational Home Economics and Clothing and Textiles.

Textile Research

It is recommended that those who are preparing for textile research complete a double major in CT&RA and Exact Science.

CT&RA 9, 24, 25, 27, 115, 141, 175, 185, 191, 190; Chem. 3, 4, 5, 121; Math. 35, 46, 97, 98, 99; Physics 6, 7; Bact. 1; Econ. 151; Eng. 111; Agron. 115A; An. Hus. 175.

Home Decoration

CT&RA 9, 24, 25, 27, 33, 115, 133, 140, 141, 191; H. Ad. 49, 65, 100; Landscape Arch. 3, 20, 35; Art 1, 2, 3, 22, or 122, 26, 32, 45 or 145, 111.

Textile Design

It is recommended that those who are preparing to design textiles should complete a double major of CT&RA and Art.

CT&RA 5, 6, 24, 25, 27, 105, 115, 125, 140, 141, 165, 170, 175, 185, 190, 191; Art 1, 2, 3, 32, 45 or 145, 111, 125 and additional work to complete a major.

Clothing, Textiles, and related Arts majors to be graduated from the School of Home Economics must have 18 hours of Home Economics besides the major, which should include representative subjects in Foods and Nutrition, Child Development and Household Administration.

Field Trip. A two-day field trip to be taken in the Spring quarter is required of juniors and elective for seniors majoring in Clothing, Textiles, and Related Arts. Approximate cost, \$10. The purpose is to study processes related to manufacturing and retailing of fabric and apparel, also to become acquainted with opportunities and requirements for employment in designing, manufacturing, merchandising, advertising, and home decoration.

Home Project. A home project carried out during the summer between the sophomore and junior years is required of all majors in Home Economics Education and Clothing Textiles and Related Arts. Clothing 25 is a prerequisite. The project is turned into the department within the first two weeks of the Fall quarter to be scored. The purpose is to develop speed and skill in techniques of construction and fitting through more experience than can be given in class time.

5. Dress and Personality. Open to all college girls desiring assistance in planning and selecting campus clothes to suit personality and income. No construction. Girls who expect to major in Home Economics Education should take 9 instead of this course. 2F, W or S) **Perry**

6. Construction Problems. Open to all college girls who wish to develop skill in construction techniques. Construction of a blouse speed project and two dresses or equivalent. Prerequisite: Clothing 5. (3F, W or S)

Gilmore, Dance, Perry

6. Construction Problems. Open to all college girls who wish to develop skill in construction techniques. Construction of a blouse speed project and two dresses or equivalent. Prerequisite: Clothing 5. (3F, W or S) **Dance, Perry**

9. Clothing for the College Girl. Designed to assist the college girl in selecting and adapting her clothes in terms of campus activities and personal expressiveness. Construction of a blouse speed project and a dress. Open to all college girls. (3F, W, or S) **Perry, Gilmore**

15. Clothing Selection and Appreciation for Men. Men's apparel as related to the wearer. Consideration is given fundamentals of fabric selection. Organized to meet the needs of men from all schools of the college. (3W) **Gilmore**

24. Textiles. Fibers, yarns, fabrics and finishes in relation to problems of the consumer. (3F, W or S) **Gilmore**

25. Clothing, Selection and Construction. Consideration is given alteration of commercial patterns, fitting of a basic pattern in muslin, and techniques of designing from a basic pattern. One garment is constructed with emphasis upon selection, fitting, good procedures and finishes. Prerequisites: Clothing, Textiles and Related Arts 6 or 9, 24, and prerequisite or parallel Art 2. (3F or W) **Gilmore**

27. Household Textiles. Consideration is given fabrics for household and personal use, stressing selection, utilization, care and cost. Prerequisite: Textiles 24. Consumer Education 50 recommended. (3S) **Gilmore**

33. Home Furnishings. Planned to develop skill in selecting and techniques in making, remodeling, and caring for home furnishings. The laboratory includes instruction on making of draperies, curtains, lamp shades, use of sewing machine attachments, refinishing and upholstering furniture. Open to all college girls. Outside work required. (3F, W or S) **Dance**

55. Fundamentals of Family Clothing. Family clothing problems with special study and construction of children's garments from the standpoint of the aesthetic, physiological, and psychological development of children of different age levels. Prerequisite: Clothing Textiles, and Related Arts 6 or 9 and 25. (3S) **Johnson**

105. History of Costume. Development of costume from ancient to modern times. Shows social, economic, political influence on dress and fabric. Modern fashion is interpreted in terms of historic and national costumes and world events. Prerequisite: History 4 recommended. Recommended for students in Home Economics, Costume Art, Physical Education, History, Speech and Dramatics. (3F) **Perry**

115. Costume Design. Comprehensive study of art element and principles of design as related to dress for the individual. Application and ability to achieve beauty and art, quality in dress, in the home, and daily life are aims. Prerequisites for Home Economics Education and Clothing, Textiles, and Related Arts majors: Art 1 and 2; Clothing, Textiles and Related Arts 6 or 9, 24, and 25. Art and Clothing to satisfy the instructor for others. Outside work required. (3F or W) **Johnson**

125. Applied Costume Design. Creative experience in dress designing by draping on the dress form. Emphasis is placed on fitting and understanding the effect of pattern, grain, and texture on design in dress. Problems consist of making a French lining and draping two garments. Prerequisites: Clothing, Textiles and Related Arts 6 or 9, 25, 115 140 and 165. Outside work required. (3W) **Johnson**

133. Home Decoration. A laboratory course giving experience in actual problems of home decoration, such as planning functional interiors around the family situation, refinishing woods, planning coordinated color schemes, mixing paint, etc. (3W or S) **Johnson**

140. Decorative Textiles. Historic textiles, including printed and hand woven textiles, tapestries, damasks, oriental rugs, and laces. Laboratory work consists of weaving, needlecraft, and various means of developing decoration for garments, accessories, and household furnishings. Prerequisite or parallel. (3W) **Perry**

41, 141. Weaving. Designing and weaving of personal and household articles. Aim of the class is to develop understanding of basic fabric construction and skill in the various techniques of hand weaving. (F. W. S.) Credit arranged. **Perry**

165. Tailoring. Application of techniques used in tailoring suits and coats. Prerequisites: Clothing, Textiles and Related Arts 9, 24, 25, 115. Outside work required. (3F or S) **Gilmore**

170. Flat Pattern Designing. Principles underlying design and construction of patterns for various figures. Includes drafting a basic pattern and provides opportunity for further study in designing, fitting and alteration of patterns. Prerequisites: Clothing, Textiles and Related Arts 6 or 9, 25, 115 and 125. Outside work required. (3S)

175. Textile Testing. Physical and chemical properties of textiles, fibers, laboratory and household tests used in their identification, and application of these factors to choice and care of the fabrics. Consideration to use of microscope, physical testing and quantitative analysis. Prerequisites: Clothing, Textiles and Related Arts 24 and 27. Chem. 10, 11 and 12 recommended. Outside work required. Alternative years only; offered next in 1950. (3S) **Gilmore**

185. Family Clothing Problems. Family clothing problems with emphasis on economic, sociological and psychological aspects. Practical problems may include: clothing budgets, selection of children's clothing, and care and renovation of clothing. (3F and S) **Johnson**

190 or 290. Special Problems. Independent study under direction of professor or graduate student has special interest or need. Consult department head before enrolling. Any quarter. Time and credit arranged. **Johnson and Staff**

191. Readings. Reports and discussion on current literature in clothing, textiles and related arts. (2S) **Johnson**

200. Commercial Clothing. Experience in constructing garments for adult figures on a commercial basis with emphasis on speed, efficiency, and fitting. Field trips to commercial custom tailoring and dress-making shop and alteration departments to study shop management. Prerequisites: Clothing, Textiles and Related Arts 125, 165 and 170.* **Johnson**

Foods and Nutrition

Ethelyn O. Greaves, Una Vermillion, Ethelwyn Wilcox, Professors; Edna Page, Priscilla Rowland, Elna Miller, Extension Nutritionist, Assistant Professors; _____, Instructor.

Students majoring in Foods and Nutrition are required to complete the following courses: Foods and Nutrition 24, 25, 107, 140, 141, 145, 146, 180, 191; Chemistry 10, 11, 12; Biochemistry 90 or 190. Minors may be elected within any department of any other school in the College.

Those who expect to graduate from the School of Home Economics must have 18 credits of Home Economics besides the major. These subjects should include representative courses in other departments within the school, i.e., Clothing, Textiles and Related Arts, Child Development, and Household Administration.

In addition there are definite course requirements for the specialized fields within the Foods and Nutrition Department.

Institutional Management. The majors in this field will find all the requirements for this specialized subject listed in the 4 year outline in Foods and Nutrition on pages 234 and 235.

Research: Foods and Nutrition 144.

Journalism: Journalism 12, 112.

Certification for Teaching: (See School of Education).

A Master of Science degree is offered in Foods and Nutrition.

5. Principles of Nutrition. The relation of food to the health of the individual; factors influencing the body's nutritive requirements; problems applicable to the interest of the individual student. (3F, W or S) **Rowland**

*Not given in 1950-51.

10. Nutrition and Food Preparation. (For men) Nutritive value of foods; present day problems in nutrition; selection of an optimal diet for health. Principles of food preparation and meal service. Open to men in all schools. Two lectures, one lab. **Rowland**

24. Food Preparation and Serving. Principles of food selection, preparation, and serving. Open to all women students. Two lectures, one demonstration and two three-hour labs. (5)

25. Meal Preparation for the Family. Planning, preparation and serving of meals for the family and their guests with consideration of nutritional adequacy of meals at different income levels and for special occasions. Prerequisite: Foods 24. Three lectures, one three-hour lab. (3)

100. Quantity Food Preparation for School Lunch and Special Occasions. Designed to meet needs of the Vocational Home Economics student. Emphasis on planning balanced school lunches and on organization, preparation, and service of foods in large quantities for special events. Pre-requisites: Foods 24. (3S) **Vermillion**

107. Experimental Cookery. Development of experimental methods; their application to investigation in cookery and food preservation; acquaintance with the literature in the field; preparation of the student for independent investigation in foods. Prerequisites: Chem. 5 or 11; Foods 24 and 25. (3) (Not given 1950-51) **Wilcox**

140 and 141. Advanced Nutrition. Application of fundamentals of biochemistry to nutrition of man with practice in calculation of dietaries in health. Consideration is given to nutrition of the child at all ages. Prerequisites: Biochem 90, 190 or equivalent. (3W, 3S) **Wilcox**

142. Nutrition and Dietetics. A review of fundamentals of chemistry and biology as applied to human nutrition with practice in calculation of dietaries. Required of all Home Economics Education students. Prerequisite: Organic Chem. (4F or S) **Greaves**

144. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral, and vitamin determinations. Prerequisites: Biochem. 190 or permission of instructor. (2W) **Wilcox**

145. Diet Therapy. Application of dietetic principles to problems of disease with calculation of dietaries in disease. Prerequisite: Nutrition 141. (4S) **Greaves**

146. Food Technology. A study of manufacture and preservation of food products and influence of these processes on physical, chemical and nutritive values of foods. Prerequisites: Bact. 1 and Foods 24. (3) (Not given 1950-51.) **Greaves**

160. Special Problems. Open to qualified students majoring in Foods and Nutrition upon consultation with the instructor. Any quarter. Time and credit arranged. **Wilcox**

180. Quantity Food Preparation. Principles of cooking applied to large quantity preparation, standardization of food quality and production cost. College cafeteria kitchen used as laboratory. Open only to juniors majoring in Institutional Economics. Prerequisites: F & N 5, 24 and 25. (5W) **Vermillion**

182. Institutional Organization and Management. Principles of scientific management applied to Food Service Units. Emphasis on forms of business organization, employer-employee relations, record keeping and other management problems. (3F) **Vermillion**

183. Food Selection and Purchase for Institutions. Consideration of sources, grading, standardization, basis of selection, methods of purchasing and storage of foods. A three day field trip to Ogden and Salt Lake markets and institutions. Approximate cost \$12.00. Prerequisites: 180 and 182. (4S) **Vermillion**

191. Seminar in Foods and Nutrition. Reports, discussions, and review of recent scientific literature in Nutrition. Prerequisite: Foods and Nutrition 141 or 142. (2S) **Greaves**

201. Laboratory Methods in Foods and Nutrition. Problems in foods and human nutrition including nitrogen, mineral and vitamin determination. Prerequisite: Chem. 190 or 191 or equivalent. (3) **Wilcox**

202. Biological Assay of Foods. Problems in the biological assay of vitamins in foods. (3) **Wilcox**

103 or 203. Nutrition Laboratory. Microchemical determinations of vitamins and other constituents in small amounts of blood. Prerequisite: Chem. 190 or 191 or equivalent. (3) **Wilcox**

210. Research for Master's Thesis. Credit arranged. **Wilcox**

242. Recent Developments in Nutrition. Study of problems in nutrition selected according to the needs of the students. Prerequisite: Nutrition 141. (3F or W) **Wilcox**

Household Administration

Ethelyn O. Greaves, Professor; Oretta M. Carlson, Elizabeth Colbert, Instructors.

A Bachelor of Science degree is granted in Household Administration. Opportunity is offered for studying effects of social and economic forces on the home and its management.

10. Home Economics Survey. Introduction to Home Economics. Required of all home economics majors. (1F) **Staff**

49 or 149. Home Management. Principles of household management and efficiency. Two recitation periods and one two-hour laboratory period each week (3F, W or S) **Carlson**

50. Consumer Education. Consumer's problems as they relate to food, clothing and household management. Emphasis on money management in the home. (3 F, W or S) **Staff**

65. Housing Problems. Consideration of present housing needs and practices affecting housing construction and home ownership. (3F, W or S) **Carlson**

100. Fundamentals of Household Equipment. Selection, methods of operation and care of equipment used in the home with emphasis on kitchen and laundry equipment. Consideration of home lighting, plumbing, heating and ventilating. (2W) **Colbert**

150. Home Management House. Residence students are directed in practical management of home problems. Prerequisites: H Ad 49, FN 25. Required of Home Economics Education and Household Administration majors. Elective for other upper division students upon consultation with the Dean of Home Economics and the Advisor of the Home Management House (3F, W or S). Time arranged. **Carlson**

Home Economics Education

Helen L. Cawley, Associate Professor.

A Master of Science degree may be earned in Home Economics Education.

Education 120. Methods in Teaching Home Economics. Contributions of Home Economics to the educational program. Analysis of teaching situations based upon observations of school activities; development of a method which will lead the teacher to understand better the nature of learning. Prerequisite or parallel: Psych. 102. (3F or S) **Staff**

Education 121. Problems in Teaching Home Economics. Study of recent investigation in Home Economics and General Education and their bearing upon Home Economics curriculum and teaching methods. (Especially for students who are to qualify for a Vocational Certificate.) It is suggested that this course be blocked with Education 122a and with one other three-hour Education* course so that concentrated work may be participated in on the campus prior to and following the off-campus student teaching experience. Prerequisite: Ed. 120. (4F, W or S) **Cawley**

Education 122. Student Teaching in Home Economics. Observation and teaching of homemaking under supervision in public schools having cooperative arrangement with College. Student teachers leave campus the middle five or six weeks of Fall or Winter quarter and teach a full homemaking program each day in an approved school. An occasional student may find it impossible to do the student teaching on this block plan. Such a student must receive approval of the instructor of Ed. 121 and 122a, preferably at beginning of her junior year,

to make other arrangements for student teaching. In the latter case, the student teacher will teach at least two hours daily in an approved local school in Spring. Prerequisites: Ed. 120, 121. (8W)

Cawley

Education 123. Student Teaching in Home Economics for Non-Vocational Education Majors. For student dietitians whose responsibilities will involve teaching student nurses, student dietitians, and patients. For other non-vocational homemaking majors interested in securing practical teaching experience. In Spring the student teacher teaches at least one hour daily in an approved local school. Prerequisite: Ed. 120 with Ed. 121 taken the same quarter as Ed. 122b. (4S) (This course does not fulfill requirements for Vocational Homemaking Certificate.)

Staff

Field Trip. For senior girls and graduate students enrolled in homemaking education. Planned cooperatively by students and Homemaking Education staff. Trip will probably take place during Spring Quarter, and estimated cost to participants will be given in advance.

Home Economics 199. Special Problems in Home Economics Education. Developed around individual needs of students not otherwise provided for in curriculum. (1-2 F, W or S)

Staff

Home Economics 210. Research for Master's Thesis. Credit arranged. Cawley

Seminar. Home Economics Education 237. Gives opportunity for investigation and reporting on individual problems. Cawley

Certification Requirements for Teachers of Vocational Homemaking in Secondary Schools

Follow the Home Economics Education Curricula. For transfer students, credits are evaluated by staff members and equivalent course work is accepted. Requirements for certification follow:

Group I Nine credits in courses which will assist in the understanding of young people of school age.

*Psychology 102	5
*Public Health 155	3
Psychology 112	2
Education 113	3
Child Development 60	5

Group II Six credits in understanding the school.

*Education 114	3
Education 111 or 112	3
(Educ. 112 is usually blocked with Educ. 121.)	

Group III Fifteen credits in Student Teaching, including methods.

*Education 120	3
*Education 121	4
*Education 122	8

A total of thirty-three credits in professional education, including Bacteriology 155, must be presented to meet the requirements. The special courses recommended for certification in Vocational Homemaking Education are listed above. These professional courses plus the prescribed subject matter courses in Home Economics are necessary for certification in Vocational Homemaking Education in Secondary Schools.

Types of service available to teachers:

1. Special guidance and help are given teachers who wish to return to school to meet the requirements for renewing certificates.
2. Opportunity to meet certification requirements is offered teachers or other persons.
3. Advanced study leading to Master of Science in Home Economics Education is offered.

*It is necessary to make arrangements for specific Education course with major professor at time when plans are made for Ed. 121 and 122a.

DEPARTMENT OF MILITARY AND AIR SCIENCE AND TACTICS

Army and Air Force

COLONEL THURSTON H. BAXTER, Coordinator R.O.T.C.

General Information	258
Basic Course	260
Advanced Course	260
Division of Army R.O.T.C.	262
Quartermaster Section	264
Division of Air R.O.T.C.	266
Air Administration and Logistics Section	268
Air Communications Section	269
Sponsor Drill Courses	270
Girls' Rifle Courses	270
Advanced Camp	270
R. O. T. C. Band Courses	270

General Information

Thurston H. Baxter, Colonel, Professor of Military Science and Tactics, Coordinator of ROTC Affairs; **Harold E. Cotter**, Lt. Colonel USAF, Professor of Air Science and Tactics; **Quentin L. Kendall**, Lt. Colonel QMC, Assistant Professor of Military Science and Tactics, Director QMC; **John S. Sabine**, Lt. Colonel CAC, Assistant Professor of Military Science and Tactics, Director Artillery; **Alfred B. Banks**, Major FA, Assistant Professor of Military Science and Tactics, Executive and Adjutant; **Harold D. Higgins**, Major CAC, Assistant Professor of Military Science and Tactics; **Anker C. Pedersen**, Major QMC, Assistant Professor of Military Science and Tactics; **Floyd E. Roth**, Major USAF, Assistant Professor of Air Science and Tactics; **Avery C. Bruce**, Captain USAF, Assistant Professor of Air Science and Tactics; **Alexander Capasso**, Captain QMC, Assistant Professor of Military Science and Tactics; **Edward H. Church**, Captain CAC, Assistant Professor of Military Science and Tactics; **Irvan J. Church**, Captain USAF, Assistant Professor of Air Science and Tactics; **Harold W. Christy**, Captain USAF, Assistant Professor of Air Science and Tactics; **Ralph L. Giddings, Jr.**, Captain FA, Assistant Professor of Military Science and Tactics, Director 1st Year Basic; **Joseph W. Lyons**, Captain QMC, Assistant Professor of Military Science and Tactics; **William Twitty**, Captain QMC, Assistant Professor of Military Science and Tactics; **James E. Beckett**, 1st Lt. CAC, Assistant Professor of Military Science and Tactics; **Lloyd R. Pugh, Jr.**, 1st Lt. USAF, Assistant Professor of Air Science and Tactics; **Peter M. Petrov**, CWO USAF, Assistant Professor of Air Science and Tactics, Air Force Administrative Assistant; **Frances M. Alix**, M/Sgt. FA (DEML), Instructor in Military Science and Tactics, Small Arms Instructor; **Marvin L. Brimmer**, M/Sgt. FA (DEML), Instructor in Military Science and Tactics, Ordnance Supply NCO; **Charles D. Hendricks**, M/Sgt. Inf. (DEML), Instructor in Military Science and Tactics, Assistant Instructor MS I; **John L. Holland**, M/Sgt. QMC (DEML), Instructor in Military Science and Tactics, Assistant QMC Instructor; **Samuel L. Packman**, M/Sgt. AGD (DEML), Instructor in Military Science and Tactics, Sergeant Major; **Jack R. Perry**, M/Sgt. USAF, Instructor in Air Science and Tactics, Administrative NCO; **Harvey R. Wardrop**, M/Sgt. CE (DEML), Instructor in Military Science and Tactics, Supply Sergeant; **Walter B. Speed**, 1st Sgt., USAF, Instructor in Air Science and Tactics, Supply sergeant; **David L. Chaudron**, Sgt 1st Inf. (DEML), Instructor in Military Science and Tactics, Assistant Supply Sergeant; **Jack Howard**, SFC AGD (DEML), Instructor in Military Science and Tactics QMC Administrative NCO; **Val M. Johner**, SFC (DEML), Instructor in Military Science and Tactics, Ordnance Maintenance NCO; **John L. Owen**, SFC FA (DEML), Instructor in Military Science and Tactics, Assistant Instructor MS IV; **Thomas D. Salyers**, SFC Ord (DEML), Instructor in Military Science and Tactics, Automotive Mechanics; **Joseph C. Hughes**, T/Sgt. USAF, Instructor in Air Science and Tactics, Air Force Training Aids; **Gordon H. Adkins**, Sgt CAC (DEML), Instructor in Military Science and Tactics, Assistant Instructor in Artillery; **Frederick H. Hirsch**, AGD (DEML), Instructor in Military Science and Tactics, Artillery Administrative NCO; **Norman J. McGinn**, S/Sgt USAF, Instructor in Air Science and Tactics, Assistant Administrative NCO; **N. W. Christiansen**, Professor of Music, Instructor in Band.

Collaborators

Joseph S. Kimmit, Major FA, Unit Instructor, Utah National Guard; **William J. Lee**, Captain CAC, Instructor, Officers' Reserve Corps.

UTAH STATE AGRICULTURAL COLLEGE, having accepted the provisions of the Act Congress approved July 2, 1862, is classified as a Land-Grant College and is therefore obliged to offer a course in Military and Air Science and Tactics as a part of the College curricula. The obligations to provide military instruction on Land-Grant institutions by the Act of July 2, 1862, are not altered by the National Defense Act of 1920 as amended.

Recognizing that preparation for national defense is an important duty of citizenship, and that qualities of patriotism, loyalty, discipline, leadership, and respect for constituted authority inculcated by proper military training are

valuable in the formation of character, it has been the consistent policy of the College to cooperate with the Federal Government in making the Department of Military and Air Science and Tactics as effective as practicable.

At the request of the College authorities a senior unit of the Reserve Officers' Training Corps was authorized at this Institution by the President of the United States under the provisions of Section 33 of the Army reorganization Act of June 4, 1920. Accordingly, the Board of Trustees has agreed to maintain a two-year basic course in Military and Air Science and Tactics as a required subject for all qualified male students.

The primary object of establishing units of the Reserve Officers' Training Corps is to qualify students for appointment in the Officers' Reserve Corps of the United States Army and Air Force, and also for commissions in the Regular Army and Air Force as "Distinguished Military Graduates." This training will also be as valuable to the student in his industrial or professional career as it would be should the nation call upon him to act as a leader in its defensive forces.

Enrollment in the Reserve Officers' Training Corps is not in any sense "conscription," nor does it convey liability to service in any component or branch of the United States Army or Air Force except as required for selective service deferment. As its name implies, the R. O. T. C. is an instrument of training and instruction only.

Military Science Regulations

The student by registration at the Institution, obligates himself to conform to such requirements as are or may be prescribed by the college under regulations of the Reserve Officers Training Corps. These requirements follow: Two years of military training (six credits) are required of all qualified male students. By regulations of the College, the basic course is normally required during the first and second years at the Institution.

To receive instruction at the College or to graduate from the College, the student must attend military classes and do satisfactory work in them. It is the duty of every student of whom military training is required, to see that he is properly registered for the course and to report for instruction. Students who are required to take military training but fail to register or to report for classes will, with the approval of the President, be excluded from all classes in the College. The responsibility of complying with the regulations regarding Military or Air Science rests entirely with the student.

The 11 a.m. hour on Thursdays is reserved exclusively for Military Drills. No other classes will be allowed to conflict with this hour.

A student claiming exemption from Military or Air Science must present a petition for such excuse at the time of registration. Pending the action of the petition, the student will register for the course prescribed and will enter the work of such course.

Any student who may be excused from attendance in Military or Air Science for any valid reason must make up the deficiency in other departments of study.

Every student registered for Military or Air Science is required to make a uniform deposit of \$5.00. A laboratory fee of \$2 is deducted from the deposit. The balance, less the cost of any property lost or damaged, is refunded upon the completion of the year or upon withdrawal from the course.

Reserve Officers' Training Corps

The four year course in the Reserve Officers' Training Corps is divided into the Basic Course and the Advanced Course.

The Basic Course consists of the first two years in Military or Air Science and normally corresponds to the freshman and sophomore years. When entered upon by any student it shall be a prerequisite for his graduation unless he is relieved from this obligation by proper authority. Students transferring from institutions not having R.O.T.C. Units must enroll.

The Advanced Course consists of the third and fourth years of Military or Air Science. Entrance upon the Advanced Course is elective, but once entered upon, it becomes a prerequisite for graduation, unless the student shall be honorably discharged in accordance with provisions of Army Regulation 145-10.

Student electing Military or Air Science as a major subject should do so at the beginning of the freshman year in order that sufficient time may be available to complete the Advanced Course. The School of Arts and Sciences offer a major* in Military or Air Science.

Uniforms and Equipment

An officer type uniform of standard pattern is furnished by the Department of Defense to each student taking military training. Shoes are not furnished. Each student should provide himself with a pair of brown shoes before entering the College, as they will be required immediately upon his admission.

The uniform and equipment issued for the use of a student, remains the property of the United States. At the end of each year, or at such other times as students may terminate their military training, all clothing and other supplies will be returned in a serviceable condition, not later than one week following the termination of such training. Articles which have been lost, damaged, or destroyed are charged against the student concerned.

Any student not returning the previously mentioned uniforms and equipment or not paying for articles lost shall have suspended all college credit earned at this institution until the debt to the college is liquidated.

BASIC COURSES

Students in the Basic Course are required to pursue their courses diligently until satisfactorily completed, and to meet such requirements for care of equipment as may be prescribed. In case of failure in any quarter, the student is required to repeat the work.

General conditions for enrollment in the ROTC. All students formally enrolled in the Basic and Advanced Course of the Senior Division ROTC must be—

1. Citizens of the United States.
2. Physically qualified, under standards prescribed by the Departments of the Army and Air force. (See AR 40-105). Due allowance will be made for those defects which are correctible before the student, who is otherwise qualified, becomes eligible for appointment as a commissioned officer.
3. Accepted by the institution as a regularly enrolled student.

In addition to the general conditions for enrollment in the ROTC enumerated above all students formally enrolled in the Basic Course must comply with the specific conditions listed below:

1. Be not less than 14 years of age and must not have reached 23 years of age at the time of initial enrollment in the **Basic Course**.
2. Successfully complete such general survey or screening tests as may be prescribed.

ADVANCED COURSE

In addition to the general conditions for enrollment in the ROTC enumerated in the Basic Course above, all students formally enrolled in the Advanced Course ROTC must comply with these conditions:

1. Not have reached 27 years of age at the time of initial enrollment in the Advanced Course. Formally enrolled members of the Advanced Course are exempt from induction, training, or service under the Selective Training and Service Act of 1948 as amended.
2. Successfully complete such survey and general screening tests as prescribed.
3. Be selected by the PMS and T or PASIT and the head of the institution.
4. Execute a written agreement with the Government.

*See insert to section for School of Arts and Sciences for Major in Military and Air Science subjects.

5. Have completed the Basic Course or equivalent thereof.
6. Be enrolled in an academic field prescribed by the chief of a technical service if admission to the Advanced Course in a unit of a technical service is desired.

Credit for Previous High School, Junior Division, ROTC Training

7. One quarter's credit is allowed for each year's work completed in the Junior Division ROTC. This does not obviate the college requirements of six quarters of Military or Air Science or Physical Education, so it may be used in lieu of three quarters thereof.

Credit for active military or naval service in lieu of the Basic Course, R.O.T.C.

Veterans who have been honorably discharged, or transferred to the Enlisted Reserve Corps and relieved from active duty, are given credit under the provisions of Public Law 81—79th Congress, in lieu of completion of all or part of the basic course, R.O.T.C., on the following basis:

- a. For not less than six months' active service in the Army, Navy, Marine Corps, or Coast Guard, credit in lieu of first year Basic Course.
- b. For not less than one year of such active service, credit in lieu of the entire Basic Course.

Contracts. Separate contracts are executed between the Government and students enrolled in the Advanced Course. Such a contract requires a student to complete the Advanced Course of training and to attend the Advanced Camp at the time specified unless he is sooner discharged for the convenience of the Government. The contract does not specify that the Advanced Course must be pursued without interruption. However, the contract is cancelled if the Advanced Course is interrupted for two calendar years. During their period of participation in the Advanced Course, duly enrolled students are paid monthly a monetary allowance in lieu of subsistence at a daily rate equal to the value of the commuted ration. This is an allowance and is not subject to income tax.

Summer Camp. Students attending ROTC summer camp are messed and quartered, and are paid at the rate prescribed for soldiers of the 7th grade. A travel allowance from the institution to camp and return to the institution at the rate of 5 cents a mile is authorized students eligible to attend the advanced summer ROTC camp.

R. O. T. C. Band

A military band is an element of the Reserve Officers' Training Corps, under the direction of the Band Instructor, and is governed by the rules of the Department of Military and Air Science and Tactics. Instruments are furnished by the Department of Defense.

Members of the band will be selected from among those student who are registered in Military or Air Science and who have demonstrated their ability for such selection. Tryouts for the band will be conducted under the supervision of the Band Instructor and will be held preferably during the first two weeks of each quarter. Members of the band receiving credit in Military and Air Science will be limited to not more than sixty students.

Students selected for the band are required to take all theoretical work in Military and Air Science and sufficient practical drill to insure making a creditable appearance in ranks. They play with the band at regular drill formations.

Students satisfactorily completing the Basic Course receive one credit per quarter, which may be included in the 186 credits required for graduation.

Basic

Students satisfactorily completing the Advanced Course receive three credits per quarter, which count toward the 186 credits required for graduation. In addition, students enrolled in the Advanced Course will receive six credits for

satisfactory completion of the six weeks' course at the Advanced Camp, conducted annually and normally attended after completion of the first year of Advanced Course. If the length of the summer camp is increased the credits allowed for summer camp will be increased accordingly, on the basis of one credit for each additional week, up to a total of nine weeks.

For students desiring a major in Military or Air Science, at least 6 credits of Military Science Seminar are required. Other members of the Advanced Course may take seminar with the approval of the PMS&T or PAS&T. Research work to be done in military history, tactics, strategy, logistics, development of weapons, evolution of warfare, and related fields. Practical work to be done in motors, supply, administration, etc. with the members of the staff.

Students majoring in the Schools of Arts and Sciences, and Engineering may submit Advanced Military or Air Science as a minor for graduation.

Members of the band who successfully complete the work in the various quarters receive credits as follows: First and second years, one credit per quarter in Military or Air Science.

Courses of Instruction

Classes in Military or Air Science will not be held at times other than as scheduled, but any student desiring extra instruction may make the necessary arrangements with the Professor of Military Science and Tactics or Professor of Air Science and Tactics.

BASIC COURSES

1, 2, 3. Military Science. First year.

Staff

These courses follow the Program of Instruction for Military and Civilian Colleges, laid down in Department of the Army Training Program ATP 145-1, dated 10 February 1949. They cover the following subjects:

Introduction to military science

- a. Military organization
- b. Military policy of United States, National Defense Act and ROTC
- c. Evolution of Warfare
- d. Maps and aerial photographs
- e. Military psychology and personnel management
- f. First aid and hygiene

Elements of national power

- a. Geographical foundations of national power
- b. Military problems of the United States
- c. Military mobilization and demobilization

Leadership, drill, and exercise of command

(1F. 1W. 1S)

Division of Army ROTC

ARTILLERY SECTION

MILITARY SCIENCE II—SECOND YEAR BASIC ARTILLERY

4, 5, 6. Military Science, Antiaircraft Artillery.

These courses follow the Program of Instruction for Military Science II, as laid down in the Army Training Program 145-1, dated 10 February 1949, and contain 90 hours of instruction as listed below:

- a. Leadership Drill and Exercise of Command, 30 hours. The emphasis in this course is placed on developing the qualities of leadership, so important in all phases of the student's life.

b. Introduction of branch technique, 60 hours. The sub-courses included in the introduction of branch technique are:

Introduction to anti-aircraft artillery automatic weapons
 Characteristics, capabilities and limitations of automatic weapons
 Service of the piece—automatic weapons fire unit
 Introduction to anti-aircraft artillery guns
 Characteristics, capabilities and limitations of 90 mm guns
 Characteristics, capabilities and limitations of 90 mm guns
 Service of the piece—90 mm

(1F, 1W, 1S)

Beckett

MILITARY SCIENCE III—FIRST YEAR ADVANCED ARTILLERY

101, 102, 103. Military Science, Anti-aircraft Artillery.

These courses follow the Program of Instruction for Military Science III, as laid down in the Army Training Program 14-1, dated 10 February 1949, and contain 150 hours of instruction as listed below:

a. Leadership Drill and Exercise of Command, 30 hours. Here again the emphasis is placed on developing the qualities of leadership in the students. The Corps of Cadets is formed into a brigade for the purpose of giving to as many students as possible the opportunity for command positions.

b. Branch tactics and technique, 120 hours. The sub-courses included in branch tactics and technique are:

Anti-aircraft artillery tactics
 Basic gunnery
 Communications
 Individual Weapons and marksmanship
 Motors and transportation
 Organization
 Troop movements

These subjects are concerned with the latest developments and trends in AA units of all echelons. Direct contact is maintained with the Anti-aircraft and Guided Missiles School at Fort Bliss Texas, the headquarters of new developments in this field. The latest material and training aids are available to supplement instruction by experienced and capable officers, all combat veterans of World War II. The ultimate goal of this course is a Commission in the Officers' Reserve Corps, or a career and Commission in the Regular Army through the "Distinguished Military Graduate" program. (3F 3W 3S)

Church, E. H.

MILITARY SCIENCE IV—SECOND YEAR ADVANCED ARTILLERY

104, 105, 106. Military Science, Anti-aircraft Artillery.

These courses follow the Program of Instruction for Military Science IV, as laid down in the Army Training Program 145-1, dated 10 February 1949, and contain 150 hours of instruction as listed below:

a. Leadership Drill and Exercise of Command, 30 hours. This course emphasizes the development of the traits of leadership important in all phases of the student's life. The units are formed into a Cadet Brigade and the cadet officers direct and supervise all activities pertaining thereto. A maximum number of students are given command and staff position affording a great deal of experience in Regular Army procedures.

b. Common subjects 40 hours. The sub-courses included are:

Military Administration
 Military Law
 Military Teaching Methods
 Psychological warfare

These common subjects are courses that are applicable to all Arms and Services and are also considered fine orientation courses for any college curriculum.

- c. Branch tactics and technique 80 hours. The sub-courses included are:
- Antiaircraft artillery materiel
 - Antiaircraft artillery tactics, advanced
 - Command and Staff
 - Combat Intelligence
 - Gunnery
 - The Military Team
 - New Developments
 - Supply and Evacuation
 - Field Artillery, Capabilities and Employment

These subjects are concerned with latest developments and trends in AA Units of all echelons, taught by veteran instructors. Direct contact is maintained with the Antiaircraft Artillery and Guided Missile School at Fort Bliss, Texas and the White Sands Proving Ground, New Mexico to insure the latest information on new developments. The best that the Army has to offer is available in the war of training aids and materials are available to supplement instruction. The ultimate goal of this course is a Commission in the Officers' Reserve Corps, or a career and Commission in the Regular Army through the "Distinguished Military Graduate" program. (3F 3W 3S)

Sabine

The Advanced Artillery Summer Camp

100. Military Science, Antiaircraft Artillery Summer Camp. Six weeks of summer training at an army installation stressing practical training carried out under the guidance of experienced officers and men of the Regular Army. It consists of work on the latest types of equipment. Normally taken between the two academic years of the Advanced Course. This may, however, for other academic reasons (Civil Engineering Camp, Forestry Camp or Summer School) be postponed for one summer. (6)

Sabine

QUARTERMASTER SECTION

MILITARY SCIENCE II—SECOND YEAR BASIC QUARTERMASTER

14, 15, 16. Military Science, Quartermaster.

The objective of these courses is to provide the ROTC student with an introductory familiarization of Quartermaster tactics and techniques which ultimately will enable him to perform the varied functions of an officer engaged in Quartermaster activities within units, organizations, posts, depots and specialized operations. The combined courses offer 90 hours of instruction in subjects listed below:

- Leadership, Drill and Exercise of Command
- Organization for Supply in the Army
- Organization and Functions of the Quartermaster Corps
- Classification of Supplies
- Research and Development
- Functions and Operations of Quartermaster Units
- Units and Organization Supply

(1F. 1W. 1S.)

Twitty

MILITARY SCIENCE III—FIRST YEAR ADVANCED QUARTERMASTER

111, 112, 113. Military Science, Quartermaster.

These courses are designed to acquaint ROTC cadet officers with the fundamental knowledge that is required of an Army officer to properly discharge his duties in the performance of various types of Quartermaster supply and service activities. Close liaison is maintained with the Quartermaster Technical Training Service, Camp Lee, Virginia, which provides information on the latest developments and techniques in the Army supply and service fields. Throughout the course emphasis is placed on training in leadership. The three courses offer 150 hours of instruction in subjects listed below:

Leadership, Drill and Exercise of Command
 Station Supply
 Depot Supply
 Storage and Warehousing
 Procurement, Storage and Distribution of Petroleum Products
 Commissary Operations
 Garrison and Field Bakery Operations
 Post and Field Laundry Operations
 Food Service Activities
 Maintenance and Reclamation of Quartermaster Supplies
 Individual Weapons and Marksmanship

(3F. 3W. 3S)

Pedersen

MILITARY SCIENCEIV—SECOND YEAR ADVANCED QUARTERMASTER

114, 115, 116. Military Science, Quartermaster.

These courses are arranged to give Senior Cadet Officers training in leadership and provide them with a clear understanding for the organization, functions and procedures of the Quartermaster Corps, and also with a well rounded knowledge of the various components and branches of the Department of the Army and how they operate as a team. Satisfactory completion of these and all prerequisite courses will qualify cadet officers for appointment as a 2nd Lieutenant in the Officers' Reserve Corps of the Army of the United States and in the Regular Army. 150 hours instruction is given in subjects common to all branches of the Army and in tactics and technique of the Quartermaster Corps.

Common subjects, consisting of 70 hours, are designed to develop leadership qualities of the student. Each cadet officer is given a key assignment as an officer in the cadet Brigade. Such assignments are made on a merit basis and are based on academic standing plus performance at Summer Camp. Principal subjects are listed below:

Leadership, Drill and Exercise of Command
 Military Administration
 Military Law and Boards
 Military Teaching Methods

Quartermaster subjects, consisting of 80 hours, are closely related to courses of instruction offered by the School of Commerce, the School of Agriculture and some departments of the School of Arts and Sciences. Emphasis is placed on the close tie-in that Quartermaster operations has with many career fields of industry, agriculture, small business and professions. Principal subjects offered are:

Fiscal Procedures
 Procurement Procedures
 Command and Staff
 Organization and Functions of Combat Arms
 Organization and Functions of Technical Services
 Quartermaster Operations in the Zone of Interior
 Quartermaster Operations in the Theater of Operation

Cadet officers who have a high standing in military subjects and have demonstrated both an outstanding quality of leadership and a definite aptitude for military service are designated Distinguished Military Students and thereby are qualified to make an application for a direct Army commission.

(3F. 3W. 3S)

Kendall

Quartermaster Summer Camp

110. Military Science, Quartermaster Summer Camp.

The Quartermaster Summer Camp consists of six (6) weeks practical training under regular army officers at a military post or training center designated by the Department of the Army. All training is under field conditions utilizing the latest equipment developed.

Attendance at Summer Camp is required of all advanced course students the first summer after registration in the advanced course. Postponement to the following summer will be authorized only for academic reasons. Six (6) credit hours are given for satisfactory completion of the camp training. Kendall

Division of Air ROTC

AIR INSTALLATION SECTION

AIR SCIENCE II—SECOND YEAR BASIC AIR INSTALLATION

24, 25, 26. Air Science, Air Installation.

These courses follow the program of instruction as laid down by the Air Force and contain 90 hours of class attendance as listed below:

a. Leadership, Drill and Exercise of Command 30 hours. The emphasis in this course is placed on developing the qualities of leadership that are considered highly important in the student's life whether he elects to continue on with his military training or not.

b. Introduction to specialized subjects 30 hours. This sub-course is designed to introduce the student to one of the Air Science courses that are in accordance with his major subject. This course will lay the foundation for further training in Air Science III and Air Science IV. A basic student, however, is not required to continue on with Military Science past the Second Year Basic courses.

For the first time the basic ROTC course will offer the student instruction of a specialized Air Force nature. At the completion of the first quarter of Air Science II, it will be necessary for the student to choose the specialized subject he wishes to pursue based on the following academic prerequisites:

Air Force ROTC Specialized Course

Air Force ROTC Specialized Course	Academic Major
Air Force Communications	(1) Electrical or General Engineering
	(2) Electronic Physics
	(3) Other Engineering
Air Installations	(1) Civil Engineering
	(2) Industrial Engineering—
	Architecture
	(3) Other Engineering
General Administration	(1) Business Administration
	(2) Any course of study leading to the
	Baccalaureate Degree

a. Every student will be assigned the course most closely related to his academic major and in case of conflict, the PAST will determine the assigned course considering the student's background, military service and previous civilian or military training. This information will enable the student to specialize in one of three specific fields in USAF. The following specialized subjects are offered: Administration and Supply, Communications, and Air Installations.

b. After completing thirty hours of specialization in the Second Year Basic course, Air Force students may elect to continue their specialized training in the two year advanced course. This curriculum is designed to make available to the student the specialized information which will best fit him for a career in the USAF, whether he chooses an active duty or an inactive duty status. This curriculum emphasized specialized studies in Administration and Supply, Communications and Air Installations plus work of such a nature that the overall picture of the functioning of the Air Force and the part that each member plays in it is brought out. Most up-to-date training-aids, movies, plus newly written text-books all combined to make the course interesting as well as educational. Upon completion of the course, a student will be potentially qualified for a particular job in the Air Force, according to the specialized course he has pursued. The final goal of the Air ROTC training program for the cadet is a commission as a second lieutenant in the United States Air Force Reserve or a commission in the regular Air Force. Those who elect to take the Advanced Air ROTC course (Air Science III and Air Science IV) are eligible to be des-

ignated "Distinguished Military Students" upon completion of Air Science III and junior year of college. Upon graduation Distinguished Military Students may apply for a commission in the regular Air Force. Those who desire pilot training will be given priority upon graduation from college and may undergo such training in the rank of second lieutenant with all the pay and privileges inherent thereto. (See Air Science III for description of specialized courses). Those who elect and are found qualified to pursue the advanced Air ROTC course will be paid at the rate of ninety cents per day throughout Air Science III and Air Science IV.

c. Common subjects 30 hours. All Basic students will take this course who are enrolled in the Air Science. This course is designed to acquaint the student with some of the problems of the Air Force as well as some of the techniques that are employed. This course will give the student a better background to understand and use the information that is offered in the Advanced courses. The subjects that are covered are as follows:

1. Aerodynamics and Propulsion
2. Weather and Navigation
3. Applied Air Power

(1F, 1W, 1S)

Pugh

AIR SCIENCE III—FIRST YEAR ADVANCED AIR INSTALLATION

121, 122, 123. Military Science, Air Installations.

These courses contain 150 hours of instruction as listed below:

- | | |
|---|----------|
| A. Voice and Command | 5 hours |
| Psychology of Leadership | 10 hours |
| Leadership, Drill and Exercise of Command | 15 hours |
| Orientation | 3 hours |
| Air Operations | 17 hours |
| Logistics | 10 hours |
| B. Air Installations | 90 hours |

This course is designed to give the students an understanding of grounds, maintenance, design of runways, roads and railroads, methods of operation for refuse collection, corrective measures for insect and rodent control, operational procedures for sewage disposal and treatment, principles of water supply and treatment, fire prevention and aircraft practices, and electrical facilities as concerned with an Air Force Base. This course is particularly well suited to Civil Engineering Majors as it offers them further training in their field both in college and on active duty. (3F. 3W. 3S)

Church, I. J.

AIR SCIENCE IV—SECOND YEAR ADVANCED AIR INSTALLATIONS

124, 125, 126. Military Science, Second Year Advanced Air Installations.

These courses contain 150 hours of instruction as listed below:

- | | |
|---|----------|
| A. Military Administration | 12 hours |
| Inspection General | 5 hours |
| Military Teaching Methods | 10 hours |
| Military Law and Boards | 14 hours |
| AF Management | 5 hours |
| Career Development | 5 hours |
| Leadership, Drill and Exercise of Command | 30 hours |
| Orientation | 4 hours |
| B. Air Installations | 50 hours |

This course is designed to give the students an understanding of Air Installation Administrative practices, cost accounting, real estate facilities, and Air Installations Supply procedures. (3F. 3W. 3S)

Church, I. J.

The Advanced Air Installations Summer Camp

120. Military Science, Air Installations Summer Camp.

The Air Force Summer Camp consists of six (6) weeks of practical training at an established Air Force Base. These camps are conducted by Regular Air Force Officers and offer the cadet training with the latest equipment being used by the Air Force.

Unless exempt the cadet will attend the camp the next summer following the signing of the contract. Exemptions are authorized only for students who are required to attend summer school or summer school camps, such as Forestry or otherwise. In this case the student is required to attend camp the following summer.

Students who volunteer may participate in local aerial flights while attending ROTC Summer Camp. (6 Su)

AIR ADMINISTRATION AND LOGISTICS SECTION

AIR SCIENCE II

SECOND YEAR BASIC AIR ADMINISTRATION AND LOGISTICS

34, 35, 36. Military Science, Air Administration and Logistics.

Same as AIR INSTALLATION—Note Paragraph "b". (1 F, 1W, 1S)

Roth

AIR SCIENCE III

FIRST YEAR ADVANCED AIR ADMINISTRATION AND LOGISTICS

131, 132, 133. Military Science, Air Administration and Logistics.

This course has been designed to give the student fundamental training in the procedures of administration and supply for the Air Force. It, however, has many basic principles that are of great value to any one in future dealings. It is highly recommended for the student who is not specializing in one of the exact sciences or in engineering in his college course. The information given in this course may be pursued as a career in the Air Force or the experience gained by a short period of application of this information in the Air Force may be used to an advantage in civilian occupation as follows:

Personnel Manager
Business Manager
Executive
Stock Comptroller
Procurement Chief
Store Manager
Buyer
Cost Accountant
Recreational Director
Coach
Reporter—Editor

In addition to this specialization which comprises 90 hours of the class attendance there is instruction in the following:

- | | |
|---|----------|
| 1. Leadership, Drill and Exercise of Command..... | 15 hours |
| 2. Voice and Command | 5 hours |
| 3. Psychology of Leadership | 10 hours |
| 4. Logistics | 10 hours |
| 5. Air Operations | 15 hours |

These courses are designed to give the student an overall knowledge of the functions of the Air Force as well as experience in handling men or in carrying out the duties of a leader. (3F, 3W, 3S)

Roth

AIR SCIENCE IV SECOND YEAR ADVANCED AIR ADMINISTRATION AND LOGISTICS

134, 135, 136. Military Science, Air Administration and Logistics.

This course contains 150 hours of instruction as listed below:

Inspector General	5 hours
Military Teaching Methods	22 hours
Military Law and Boards	14 hours
Air Force Management	20 hours
Career Development	5 hours
Leadership, Drill and Exercise of Command	30 hours
Orientation	4 hours
Air Administration	50 hours

This course is designed to give the student an understanding of Air Force Administration and Logistics on a Staff level in addition to the common subjects listed above. (3F. 3W. 3S) Roth

The Advanced Air Administration and Logistics Summer Camp

130. Military Science, Air Administration and Logistics Summer Camp.

The Air Force summer camp consists of six (6) weeks of practical training at an established Air Force Base. These camps are conducted by Regular Air Force Officers and offer the cadet training with the latest equipment being used by the Air Force.

Unless exempt the cadet will attend the camp the next summer following the signing of the contract. Exemptions are authorized only for students who are required to attend summer school or summer school camps, such as Forestry or otherwise. In this case the student is required to attend camp the following summer.

Students who volunteer may participate in local aerial flights while attending ROTC summer camp.

AIR COMMUNICATIONS SECTIONS

AIR SCIENCE II—SECOND YEAR BASIC AIR COMMUNICATIONS

44, 45, 46. Military Science, Air Communications.

Same as AIR INSTALLATIONS—Note paragraph "b".

AIR SCIENCE III—FIRST YEAR ADVANCED AIR COMMUNICATIONS

141, 142, 143. Military Science. The Air Communications course, covers fundamentals of electricity, the organization of Air Force communications, wire communications, radio, radar, supply and maintenance, and visual communications and other subjects pertinent to Air Force communications. Upon completion of the Air Communications course the student will be well schooled as a Communications Officer in the USAF Reserve.

These courses contain 150 hours of instruction as listed below:

A. Voice and Command	5 hours
Psychology of Leadership	10 hours
Leadership, Drill and Exercise of Command	15 hours
Orientation	3 hours
Air Operations	17 hours
Logistics	10 hours
B. Air Communications	90 hours

This course is designed to give the students an understanding of wire communications, radio communications, radar, visual communications and communication supply and maintenance. This course is particularly well suited to Electrical and Radio Engineering Majors as it offers them further training in their field both in college and on active duty. (3F. 3W. 3S) Christy

AIR SCIENCE IV—SECOND YEAR ADVANCED AIR COMMUNICATIONS

144, 145, 146. Military Science, Air Communications, Second Year Advanced.
These courses contain 150 hours of instruction as listed below:

A. Military Administration	12 hours
Inspection General	5 hours
Military Teaching Methods	10 hours
Military Law and Boards	14 hours
AF Management	20 hours
Career Development	5 hours
Leadership, Drill and Exercise of Command	30 hours
Orientation	4 hours
B. Air Communications	50 hours

This course is designed to give the students an understanding of Air Communications Administrative practices, duties of Communications Officers and Message Center Procedures. (3F. 3W. 3S) **Christy**

The Advanced Air Communications Summer Camp**140. Military Science, Air Communications Summer Camp.**

The Air Force summer camp consists of six (6) weeks of practical training at an established Air Force Base. These camps are conducted by regular Air Force Officers and offer the cadet training with the latest equipment being used by the Air Force.

Unless exempt the cadet will attend the camp the next summer following the signing of the contract. Exemptions are authorized only for students who are required to attend summer school or summer school camps, such as Forestry or otherwise. In this case the student is required to attend camp the following summer.

Students who volunteer may participate in local aerial flights while attending ROTC summer camp.

SPONSOR DRILL COURSES

- 51, 52, 53. Military Science, Sponsor Drill.** Freshman year. A drill course for girls elected to Corps of Sponsors. (1F. 1W. 1S) **Staff**
54, 55, 56. Military Science, Sponsor Drill. Sophomore year. (1F. 1W. 1S) **Staff**
153, 152, 153. Military Science, Sponsor Drill. Junior Year. (1F. 1W. 1S) **Staff**
154, 155, 156. Military Science, Sponsor Drill. Senior Year. (1F. 1W. 1S) **Staff**

GIRLS' RIFLE COURSES

- 63. Military Science, Girls Rifle Course.** A basic course in marksmanship. (S) **Staff**
163. Military Science, Girls' Rifle Course. An advanced course in marksmanship. (S) **Staff**

SEMINAR

171, 172, 173. Military Science Seminar. Prerequisite: First year advanced ROTC course (Artillery, Quartermaster, or Air Force) and approval of PMS&T or PAS&T. May be taken concurrently with first year advanced course. Credits arranged. **Staff**

174, 175, 176. Advanced Military Science Seminar. Prerequisite: Military 151, 152, or 153, second year advanced ROTC (Artillery, Quartermaster, or Air Forces) and approval of PMS&T or PAS&T. May be taken concurrently with second year advanced course. Credits arranged. **Staff**

R.O.T.C. BAND COURSES

- 1B, 2B, 3B. R.O.T.C. Band.** First year. (1F. 1W. 1S) **Christiansen**
4B, 5B, 6B. R.O.T.C. Band. Second year. (1F. 1W. 1S) **Christiansen**

RESEARCH AND EXTENSION

Agricultural Experiment Station	272
Engineering Experiment Station	273
Extension Service	274
Extension Classes, Home Study, Visual Aids	274
Summer School	276
Evening School	276
Branch Agricultural College	278

Agricultural Experiment Station

R. H. Walker, Director

The Agricultural Experiment Station, established in 1889, is a major division of the College. It is responsible for conducting research in Utah under provisions of the Hatch, Adams, Purnell, Bankhead-Jones and Agricultural Research and Marketing Acts of Congress, and of various acts of the Utah State Legislature. Its primary objective is to conduct experiments and scientific researches that have for their purpose the establishment and maintenance of a permanent and efficient agricultural industry and the development and improvement of the rural home and rural life. Research results are prepared for dissemination in the form of bulletins and scientific articles. They form the basis for much of the work of the Agricultural Extension Service.

The Agricultural Experiment Station staff numbers approximately 120, many of whom are also members of the teaching faculty of the College; some of them also divide their time with the Agricultural Extension Service of the College. In addition, several employees of various bureaus of the U. S. Department of Agriculture are assigned to collaborate in the agricultural research program of the station.

The main offices of the Agricultural Experiment Station, including the office of the Director, the Division of Publications, and the Statistical Laboratory, are on the College campus, on the first floor, south wing of the Main Building. Most of the research laboratories used by the Experiment Station are also on the campus, distributed as necessary among the various College buildings.

Greenhouses are maintained for investigations in horticulture, vegetable crops, agronomy, botany, plant pathology, entomology, bacteriology and range management.

Livestock husbandry investigations are conducted at the barns on the College campus, at the Branch Agricultural College, at the U. S. Forest Service Desert Range Station, at the Benmore Experimental Range in Tooele County, and on the ranges in different parts of the state.

The Station also maintains a number of experimental farms:

At the **Dairy Experimental Farm**, composed of about 130 acres of land, barns and a house, the Station maintains an experimental Holstein Friesian dairy herd of about 60 pure-bred animals. Pasture investigations are also conducted here.

The **Greenville Farm**, a 45-acre tract, is used for experimental work in plant breeding and other phases of crop production.

The **Farmington Substation** at North Farmington is a 57-acre tract used for experimental work in horticulture and vegetable crops.

At the **Nephi Farm** experimental work in dry farming and range seeding is conducted. This farm is composed of 103 acres.

The **Forage Experiment Farm**, a 42-acre tract located south of Logan, is used in cooperation with the U. S. Bureau of Plant Industry, Soils and Agricultural Engineering for study of the improvement of forage plants. Special attention is given development of improved plants for irrigated pastures and for range lands.

The **Ogden Substation** located in Weber County north of Ogden is a 71-acre tract used for investigation in fruit production.

The **Poultry Experimental Farm**, a new farm in North Logan, is used for research on the breeding, feeding, and control of disease in chickens.

The **Turkey Experimental Farm** is a new 33 acre farm east of the Campus used for turkey breeding, nutrition, and disease control studies.

The Station also owns farm plots near the College and rents land for experimental purposes in various parts of Utah.

Other investigations not involving land use are conducted throughout the state. Among these may be mentioned the soil survey work; plant disease surveys, problems of injurious insect control; problems connected with land use, agricultural marketing and farm management; studies of the social problems

connected with rural living; the gathering of snow survey data; problems connected with irrigation and the surveying of range resources.

The research facilities have a three-fold importance in the institution: First, they make it possible for the teaching faculty to fortify instruction with the results of original research; second, they afford advanced students an opportunity to keep in touch with research methods and facilities; and third, they offer employment to students qualified to act as research assistants or laboratory aids. Between 50 and 100 students thus employed are on Station payrolls each month of the school year. Several find employment in laboratories and on the experimental farms during the summer months.

Major lines of research now in progress include projects in the departments of Agricultural Economics, Agronomy, Animal Husbandry, Dairy Industry, Poultry Husbandry, Veterinary Science, Botany and Plant Pathology, Bacteriology and Public Health, Chemistry, Forestry, Home Economics, Horticulture, Irrigation and Drainage, Landscape Architecture and Planning, Physics, Range Management, Rural Sociology, Vegetable Crops, Wildlife Management, and Zoology, Entomology, and Physiology.

Engineering Experiment Station

J. E. Christiansen, Director

By act of the Board of Trustees of the Utah State Agricultural College, December 2, 1918, the Utah State Engineering Experiment Station was established to serve the State in a manner broadly outlined as follows:

(1) To serve those industries and utilities affecting the agricultural and rural populations of the State and to aid public officials and teachers by making engineering investigations of significance and interest to them.

(2) To further the development of methods of processing and use of waste products from agriculture.

(3) To develop methods of processing and making available for use the undeveloped agricultural and industrial raw materials of the State.

(4) To further develop the science of Irrigation and Drainage to the end that the land and water resources of the State may be most fully utilized.

(5) To stimulate a greater use of native materials in rural housing and farm structures.

(6) To develop applications and uses of power equipment and to help solve problems relating to the water supply and sanitation of the farm home.

(7) To develop new tillage, harvesting, and weed control equipment.

(8) To develop new methods and uses of native materials in the construction of farm-to-market roads and highways.

(9) To cooperate with the Federal government in the conducting of investigations along these and other lines of engineering in harmony with the functioning of the Land-Grant College.

(11) To publish and distribute through bulletins, circulars, and technical articles in periodicals the results of such studies, surveys, tests, investigations and researches as will be of greatest benefit and interest to the people of Utah.

The Engineering Experiment Station is an integral part of the School of Engineering and Technology, and the laboratory facilities and shops of the School of Engineering are available for the investigational work of the Station to extent of sums allocated for their operation and support.

The Dean of Engineering is Director of the Station; and the staff consists of members of the teaching staff, School of Engineering and Technology.

Extension Service

Carl Frischknecht, Director

Farm income is expressed in terms of cash; fresh food, comfortable homes, and pleasant surroundings. The stabilizing effect of farm ownership and close contact with nature develop virtues in farm families which result in the highest type of citizens.

The main objective of the Extension Service is to aid rural people in developing useful and satisfactory lives. Its programs are designed to help people help themselves, rather than doing things for them. It gets the people's view point of their problems and needs through program planning meetings. Rural leadership is developed by encouraging groups of people to analyze their own problems. A plan to solve these problems becomes the Extension program of work.

Extension programs conducted with and for the people usually result in increased production per acre and per animal unit, more efficient marketing, conservation of the soil and other natural resources, improvement of homes, improvement of health by better balanced diets, 4-H Club work which give boys and girls more appreciation for the farm and home and better understanding of national and world affairs.

The Extension Service is a part of the College, and a part of the Federal Extension Service. It has agricultural and home demonstration agents in practically every county. Cooperating with the agents is a state staff of specialists in agricultural economics, agricultural engineering, agricultural forestry, agronomy, animal husbandry, cattle marketing, 4-H Club work, clothing, consumer education, dairy, dairy manufacturing, entomology, home furnishings, home management horticulture, irrigation, marketing, nutrition, poultry, recreation, rural sociology, and soil conservation.

To help train rural leaders, the Extension Service conducts free, non-credit short courses in various agricultural and home economic subjects. These courses are given at the College.

EXTENSION CLASSES, HOME STUDY, BUREAU OF VISUAL AIDS IN EDUCATION

L. G. Noble, Supervisor

The department of Extension class work, Home Study courses, programs and the Bureau of Visual Aids in education is fully accredited by the National University Extension Association.

Through its Extension Service the College also offers extension classes, home study (correspondence) courses, and visual aids in education. People interested in these services should contact their local county extension agent.

EXTENSION CLASSES. Extension Classes are offered in practically all subjects. In-service helps to teachers are available in every department including classes for the renewal of teaching certificates. Classes will also be provided in vocational fields and for special-study groups.

HOME STUDY. Utah State Agricultural College was one of the first educational institutions of the Intermountain Region to establish a Home Study Department. Correspondence Study furnishes an excellent opportunity for systematic instruction to students of High School or College grade and to all adults who desire to obtain information in selected fields.

Students must be at least nineteen years of age, or must submit fifteen units of high school work, or must be graduates of a high school for admission to Correspondence study courses of college grade. One-fifth of the credits (37) necessary for a degree may be earned through this department.

In the College division a wide variety of subjects is offered in the following departments: Agricultural Economics and Marketing, Agronomy, Animal Husbandry, including Poultry and Dairying, Art Bacteriology, Business Administration and Accounting, Economics, Education, English, Entomology, Forestry, Geology, Home Economics, History, Horticulture, Irrigation and Drainage, Mathematics, Political Science, Psychology, Public Health and Zoology.

Preparatory or high school courses are offered for those who have been unable to complete their high school courses and who wish to satisfy the entrance requirements of the College and also for those who wish to fit themselves for careers in which the equivalent of a high school education is necessary.

A special catalog of Home Study Courses will be mailed on request.

REGULATIONS GOVERNING EXTENSION WORK

I. GENERAL

All instructors in extension courses are either members of the regular teaching faculty officially assigned to the teaching project concerned, or non-resident members appointed under the procedure customary for faculty appointment in the Institution.

Extension credit courses given by direct class instruction shall:

- (a) be equivalent in content, hours of class instruction and preparation, to similar courses offered in residence work,
- (b) be subject to the same prerequisites as comparable campus courses, or as the departments may prescribe, including a comprehensive final examination.

II. RESIDENCE COURSES SUPERVISED BY EXTENSION DIVISION

Residence credit shall not be given for off-campus work without special approval of the Deans Council.

Courses carrying extension credit should not exceed 120 minute periods.

Extension classes for graduate students will not be given without special permission of the Graduate School.

Credit for Travel. Credit will be allowed for travel where previous arrangements have been made with the department of Extension class work. The maximum to be allowed shall not exceed one quarter hour of credit per week for the duration of the course. For further information contact the department of extension classes.

III. HOME STUDY COURSES

All home study courses must include a final examination.

Students registered for home study must count this study as part of their total load in case of registration for residence work at the College. If the home study of the residence registration exceeds the maximum amount permitted by the Institution, then the student must obtain the permission of the Attendance and Scholarship Committee to carry this excess load.

Each school of the College, subject to faculty approval, shall determine the nature and the amount of home study credit accepted for admission and toward graduation. In no case shall more than 25 percent of the total number of credit hours accepted for graduation be home study credit.

(For other regulations concerning Extension credits, see section on "Graduation" in introduction of this catalog.)

VISUAL AIDS IN EDUCATION. The service of the Bureau of Visual Education is being made available to all schools, clubs and community groups. At present the Bureau is especially prepared to give service in the fields of Agriculture, Home-making and Recreational Activities. New films on timely topics and subjects are being added to the Library constantly. Individuals and school and community groups are invited to contact the Bureau with their visual education problems.

Catalog information and instructions on how to obtain department films from the various depositories in the United States is available in this office.

Summer School

M. R. Merrill, Dean

For more than 30 years the College has conducted Summer School as an important part of its educational program. Since 1924, the offering has been materially enlarged and enriched. The purpose of this large educational undertaking is to bring to Logan, with its delightful summer climate and many recreational features, a number of the leading educators of the nation, and build, in the Intermountain West, a Summer School of wide influence.

During the Summer School all departments of the College offer courses, the program being arranged to meet the particular needs of summer students. The courses offered in Education, Psychology, and related departments make it possible for the students to meet all of the requirements for Utah certification. The curriculum will also meet most of the requirements for certification in surrounding states.

In past years the majority of summer students have been teachers in secondary and elementary schools. At present an increasing number of regular students are continuing through the summer. High school graduates are also entering the college immediately rather than postponing entrance to the Fall Quarter. Returning service men and women are particularly interested in a regular summer program inasmuch as nearly all of them wish to complete their education as quickly as possible. The summer curriculum is being arranged to meet this trend. Consequently, practically all of the departments are offering much of their regular program during the Summer Quarter.

Graduate Credit

Summer School students are allowed seven years in which to satisfy requirements for the Master of Science degree, but they may complete the requirement for this degree by attendance at three Summer Schools. This makes it possible to secure this degree without giving up present teaching employment. Those who expect to register for work leading to this degree should submit their credits to the dean of the Graduate School several weeks in advance of registration and indicate the subject in which they wish to major. This will make it possible to have the course of study approved at the time of registration.

Evening School

C. D. McBride, Director

The Evening School program is designed to meet the needs of busy people in all walks of life whose duties prevent them from attending college classes during the day. Classes are open to all adults who can profit by them. The program is especially suited to the needs of people in such situations as the following:

1. People who are employed during the day in business, industry, professional work, agriculture, home-making, etc., and who desire to add to their technical training for increased occupational competence.
2. Professional people and others who desire to gain additional education and credit in their professional fields.
3. People who have started in college but have found it necessary to interrupt their studies and find employment for a livelihood, and who desire to further their college education in evening classes.
4. People who have not had the opportunity of getting a college education, but who can attend classes during the evening.
5. Adult people whose high school education was interrupted before completion and who desire to make up deficiencies in college entrance requirements by taking evening classes and applying the credit for this purpose.

6. Learners in the trades who are training on-the-job and who need related technical instruction to supplement their job experience.
7. People who desire special training in particular fields.

When Held

Evening School is held on four evenings during the week; Monday, Tuesday, Wednesday and Thursday, from 7 to 10 p.m. Individual classes are held on two evenings per week, some on Monday and Wednesday, and others on Tuesday and Thursday, making it possible for students to attend Evening School two or four evenings per week as suits their needs and situation. Classes are 1½ and 3 hours in length. Theory classes are held 1½ hours and combination theory and shop classes are held 3 hours.

Three terms per year are scheduled, running concurrently with the fall, winter and spring terms of the day school.

Fees

Registration fee and tuition:

Minimum registration fee.....	\$10.00 per term of 12 weeks
1½ hour class, twice weekly.....	10.00 or two for \$18.00
3 hour class, twice weekly.....	18.00
Laboratory fee where materials are used.	

Credit

College credit is given for all Evening School classes that are numbered, as, 1, 10, 62, 81, etc. Vocational or sub-college credit is given for classes that are lettered, as, a, b, c, d, etc.

Registration

Registration is done during the first evening of each term.

Catalog

A special Evening School Catalog contains detailed information concerning this program, including description of courses offered.

Courses

All divisions and departments of the College contribute to and participate in the Evening School program. Many of the courses are designed to meet the needs of our industrial age for technical training that can be applied directly in the pursuits of life in a wide range of occupational fields, as well as for scholastic education for college credit.

A close working relationship is maintained between the school and the business, industrial, professional, agricultural and home life of the area to keep the Evening School program abreast of the needs of the people.

BRANCH AGRICULTURAL COLLEGE

H. Wayne Driggs, Director

THE Branch Agricultural College of Utah marks the date 1897 as the year of its founding. Its first service to the state was listed under the title of the Branch Normal School, of the University of Utah. With the growing need in Southern Utah for agricultural development a change of administration at the parent institution was effected in 1913 and the school then became a branch of Utah State Agricultural College. Occasion for additional training for the youth of Southern Utah was thus opened. Through new college offerings in Economics, Vocational Industrial Education, Basic Arts and Sciences, Business, Social Sciences and Education young men and women now find increased opportunity to become better home and community builders. Significantly of value is the fact that all Branch Agricultural College courses parallel those of the parent institution.

Nine men have served as heads of the Branch Agricultural College since its founding. The first four were known as Principals and held office as follows while the school was a part of the University of Utah: Milton Bennion 1897-1900; J. Reuben Clark 1900-1901; Nathan T. Porter 1901-1904; George W. Decker 1904-1913. The remaining five men have been titled Directors since the institution became the Southern Branch of the Utah State Agricultural College. They may be listed accordingly as Roy F. Homer 1913-1921; P. V. Cardon 1921-1922; J. Howard Maughan 1922-1929; Henry Oberhansley 1929-1945. Dr. H. Wayne Driggs, the present Director has served the College since 1945.

Beginning with 1936-37 school year, the Board of Trustees authorized the addition of Senior Division courses in Agronomy, Animal Husbandry, and Agricultural Economics and related work. This enables students in Agriculture to obtain a B.S. degree in these departments with one year of additional work at Utah State Agricultural College, Logan.

In 1948-49 courses for the training of elementary teachers to the Bachelor's Degree were authorized by the Board of Trustees.

The first regular summer school of the College was instituted in June of 1949.

The Extension Service and the Agricultural Experiment Station are closely connected with the B. A. C., and certain members of the resident staff at Cedar City are also members of the staff of these two divisions. The deans of the parent institution supervise closely the work of the corresponding divisions here.

List of Graduates, 1949

TWO-YEAR CERTIFICATES

Air Conditioning and Refrigeration

Larsen, Milton B.
Murley, Eldon L.

Nalder, Lane Kenley

Oborn, Keith M.

Automotive Repair

Johnson, John Homer
Lee, Ivan E.
LeFevre, L. Dwain

Parker, Chester
Peterson, Ray W.
Samil, Hormonz

Wiser, James Gordon
Zwinski, Carl Allen
Zwinski, John Bertel

Carpentry

Arjomand, Morteza Amir
Friedli, Lorin F.
Godfrey, Blaine B.

Hatch, Vedell L.
Phillips, David L.

Steel, Darius H.
Wilkes, Doran F.

Diesel and Heavy Duty Mechanics

Peterson, Joel L., Jr.

Welding

Carlson, Edwin
Hardman, Joseph Henry

Sonderegger, R. Clayton

Western, Grant L.

Home Economics

Ahl, Touran

BACHELOR OF SCIENCE IN AGRICULTURE

Anderson, Stewart Sterling
Ashcroft, Rulon T.
Bateman, Bertin Kyle
Belnap, Lowell Hall
Beutler, O. Gene
Bohman, Verl Rudolph
Broderick, John Howard
Brower, Stephen Leon
Brown, Earl S.
Burnham, Owen Wallace
Carver, Norman Elmer
Chadwick, Keith F.
Clark, Craig Anderson
Condie, Malcolm Kenneth
Cox, Clyde K.
Cuff, William Ward
Curtis, John Keith
Davis, Jess H.
Davis, Lynn Herman
Dev, Narendra S.
Draper, Rulon Parnell
Erickson, Alfred Gordon
Ernststrom, Carl Anthon
Fitzgerald, Jack F.
Frandsen, Oscar Reed
Freestone, Ferris Tolman
Gardner, Arthur Wendel
Gottfredson, Harold Arthur
Grover, Ben Leo
Guymon, Glendon J.
Hafen, Leslie
Hansen, Dean M.
Harris, William E.

Hess, Oleen
Hirschi, Frenon D.
Houck, Bruce Bernard
Hunter, Clyde Earl
Jackson, Tom James
James, John Carl
Jenkins, Claude Junius
Jenson, Alfred Calvin
Jensen, Carlyle Lorenzo
Jensen, Gale Moroni
Judd, Jackson H.
Lake, Cecil Ray
Larsen, N. Gale
Lawrence, Vernon W.
Leatham, Rulon James
Ludlow, Bruce
Lund, Kirk W.
MacNeil, Vernon Raymond
Manwaring, J. Basil
Martl, Rudolph J.
Maughan, Ora Smith
McLain, Earl G.
McOmber, Adrian S.
Mecham, Alta Hood
Merrill, Floyd W.
Miller, Ivan R.
Mineer, Harold W.
Miyasaki, Hiraatomi
Moses, Jesse F.
Murdock, Robert S.
Nelson, David G. III
Nichols, Jaye Lytell
Nilson, Major A.

Olsen, Glen Crane
Oberly, Gene Herman
Owens, Dick
Parker, Rao K.
Pattee, Robert Emery
Peacock, Byron Carlyle
Ransom, Max Prescott
Rasmussen, Jack Junior
Sanders, Doan Clarence, Jr.
Schroeder, Frank A.
Sheldon, Dwight M. II
Simons, Marr Dixon
Smith, Philip R.
Spencer, Cleon H.
Stevens, Richard G.
Stott, Laurel H.
Struthers, Robert Eugene
Tamimie, Hakkil Shihab
Taylor, Howard W.
Taylor, Keith D.
Taylor, Phillip Royden
Thomas, Dallan D.
Thomas, Don Wylie
Thompson, Orville Thayne
Thorley, Jay G.
Wakefield, Melvin L.
Wankler, Maynard C.
Wardle, Clyde Clinton, Jr.
Whitton, Leslie
Winder, Quentin C.
Woodbury, Rulon D.
Woodbury, William E., Jr.
Young, June L.

BACHELOR OF SCIENCE IN ARTS AND SCIENCES

Allan, Jay Clayton L.
 Asadi, Abdul-Aziz M.
 Bailey, Oral Lamb
 Ballam, Oral Lamb
 Becar, Noel Joseph
 Bennion, Joyce
 Bigler, Lenore Manwaring
 Bigler, Norval
 Bogh, LaJune Gunhild
 Bonnell, Harry L.
 Boudrero, Ida Lucile
 Breckenridge, Elizabeth L.
 Brough, Wayne S.
 Brown, Rodney A.
 Burgoyne, Roger Dee
 Campbell, Douglas H.
 Campbell, Roy G.
 Cannell, Lawrence George
 Child, Eldon Robert
 Christensen, Dwayne
 Conroy, Sallyanne Patricia
 Cottle, Taylor F.
 Crockett, Zenna Beth
 Crompton, Robert Phyl
 Crookston, Dorothy
 Daniels, Frank L.
 Demetras, Andrew D.
 Dexter, Jack Faulkner
 Eaton, Lee Daines
 Fackrell, Heber Garrett
 Fitzgerald, Paul Ray
 Fjeldsted, Margaret Anne
 Fleener, George Gordon
 Frandsen, Donald P.
 Gardiner, Marv
 Gardner, Wilford Robert
 Goodwin, Clarence L.
 Green, Hollis Clinton
 Guthrie, James Warren
 Hadfield, Darrell C.
 Hale, Laura Rae
 Hall, Leon L.
 Hamblin, Amy Lou
 Hanks, Lorin Robert

Hansen, Blair
 Hansen, Fay Benson
 Hansen, Halvor Peter
 Hansen, Ronald Gordon
 Haroldsen, Elizabeth Condie
 Harrison, Stanley E.
 Hayes, Nadine
 Hendricks, Charles D., Jr.
 Hoefling, Adam F., Jr.
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 Hoyt, Murray G.
 Hudman, Martha Alleen
 Hunt, Stanley R.
 Irving, Robert Bruce
 Jeffs, George A.
 Jensen, Barbara Faure Jones
 Jeppson, Paul W.
 Johnson, Kenneth Gene
 Johnson, Morris Earl
 Kowallis, Frederick R.
 Lattimore, William B., Jr.
 Lewis, Norman Gilchrist
 Lloyd, Bennion N.
 Lockhart, Kathleen Willson
 MacNeur, John M., Jr.
 Malsey, Daniel Glen
 Manful, Dwayne Eugene
 Maughan, Kenneth B.
 McBirney, Leonard
 McClellan, Stanford
 McMurdie, Wm. Evan, Jr.
 Miller, Fauntella Smith
 Miller, Gloria Myrtle
 Moarefi, Akbar
 Mohr, Jean
 Moore, Dean M.
 Mortensen, Jay Lynn
 Murdoch, Wallace P.
 Nakabayashi, Nichols T.
 Nielson, Mervin William
 Olsen, Clair Boyd
 Palacios, John R.
 Pearson, Glenn Lorenz
 Pickett, Mary

Price, Samuel
 Rasmussen, Janet A.
 Rich, A. McKay
 Richardson, Kenneth Stanley
 Robinson, Charles Albert
 Rothwell, Roberta P.
 Schaible, Lester William
 Sherin, Harry Gall
 Simpson, Keith B.
 Slack, Derald Allen
 Smith, Delmont K.
 Somers, Joseph Lester
 Stalker, Lucy I.
 Stephens, Daren M.
 Stewart, Charles James
 Stewart, John J.
 Stickler, Bert P.
 Swensen, Dwayne M.
 Tanner, Howard H.
 Taylor, John Edwin
 Thayne, Melvin E.
 Thayne, Stanley J.
 Thomas, June
 Thompson, Jacquelyn
 Tolman, Jaren L.
 Tolman, Vilate
 Turley, Jay F.
 Turner, Beverly Judd
 Wallgren, Marian Boam
 Wallgren, Rex
 Ward, Darrell Neilson
 Wareins, Colleen
 Watkins, Jack Bowling
 Weathers, Lewis G.
 Weeks, Marjorie Vie
 West, James Irvin
 Whattcott, Sabra
 Whipple, Walter LeGrand
 Winset, Ruth Virginia
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 Wright, Edward M., Jr.
 Young, Charles Edward

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 Barney, Richard J.
 Bate, Louis B., Jr.
 Bateman, Jim Sparks
 Bean, George David
 Benson, Noel A.
 Bird, Leland R.
 Bisharat, Alfred Ibrahim H.
 Boudrero, Gloria Redford
 Bradshaw, Helen
 Braithwaite, Neldon H.
 Breinholt, James E.
 Brewer, Wanda Jean
 Broadbent, Arthur Marion, Jr.
 Brown, Earl C.
 Brown, Ilan Westmoreland
 Browning, Darwin Austin
 Burton, Vern Robert
 Bushman, Henry Keith
 Buxton, Yvonne M.
 Campbell, Jay D.
 Card, Sterling Scott
 Carter, Scott K.
 Champ, George Herbert
 Christensen, Val E.
 Christiansen, John Rees
 Collier, Charles S.
 Cook, Waldo Golden
 Covington, Ross L.
 Crawford, Malcolm John
 Crookston, Rosemary

Crowther, Estella Valene
 Dunlap, Robert Murray
 Dye, Gerald J.
 Earl, Janet
 Earl, Rose Marie
 Elliott, Raymond
 Esfandiary, Monsour
 Farrow, Douglas
 Ferguson, Edward Ammon
 Flamm, Bryce C.
 Forman, Ray Glen
 Francom, J. Alan
 Frandsen, Richard Dee
 Geddes, Dea Reid
 Gessel, William Boyd
 Halgren, Spencer V.
 Hansen, Lester T.
 Harward, Bernard A.
 Hayes, Marjorie Geddes
 Hemsley, Glen Merrill
 Hensler, John D.
 Hill, Alwyn Spencer
 Hill, Edward E.
 Hinkley, Bradford Robert
 Hollingsworth, Farrell
 Holman, Joanne Brick
 Hockett, Richard R.
 Hull, DeLyle W.
 Hulse, Ariel A.
 Hyer, Earl Harper
 Jackson, Gene S.
 Jensen, Evan L.
 Jensen, Gordon I.
 Jensen, Harold Mentor
 Jensen, Hubert J.

Johansen, Donald A.
 Johnson, Dean K.
 Johnson, Leo G.
 Johnson, Stanford L.
 Jones, Fay Fuhrman
 Jorgensen, Cecil Lamar
 Jost, Dale L.
 Kearn, Willis Gordon
 Kelley, Darrell Major
 Knowles, Elmer M.
 Knutson, Lyman Burns
 Landsaw, Elmer Duff
 Laver, Clyde P.
 Lee, Max K.
 Madineh, Maan Ali Zilfo
 Madsen, Fred Rees
 Malan, Dean T.
 Malhas, Ruhl Abdul-Hamid
 Marcusen, Arlo Reid
 Martin, Burton C.
 Maughan, C. Gordon
 Maurer, Calvin Raymond
 McKinley, Robert H.
 Merrill, David Kenneth
 Monson, Leland H., Jr.
 Moody, Aubry Lee
 Moyes, Earl LeRoy
 Mulliner, Shirl Morgan
 Murphy, Stanley D.
 Nelson, Milton R.
 Newey, Robert Leroy
 Nielsen, Eugene
 Odd, Wallace Steed
 Panian, Robert E.
 Parry, Morris Roberts, Jr.

Pearce, Ralph Roberts
Perry, Jack G.
Perry, L. Tom, Jr.
Pilkington, Leland Lew
Porter, Preston Peterson
Powers, Donald D.
Randall, Cleone
Reed, Robert M.
Reese, Dale L.
Robins, Wayne D.
Robins, William Everett
Rowe, Berry W.
Russell, Francis Max

Salisbury, Lyman B.
Salisbury, Ramsden Bybee
Schvaneveldt, John A.
Schwartz, Leorial Brewer
Sigler, George H., Jr.
Simard, Victor L.
Slack, Kenneth Thurston
Smith, Patricia J.
Sorenson, Allen Henry
Sorensen, Norma L.
Stephens, Shirley Lou
Taylor, Harold V.
Taylor, Karl O.

Taylor, Lawrence Charles
Taylor, Winston G.
Thomas, Robert O.
Twitcheil, Robert M.
Turnidge, Raymon C.
Wangsgard, Cloyd E.
Warr, Margie Ruth
Williams, Ellis L.
Wiser, Grant Budge
Witmer, Robert R.
Woodland, David Hatch
Yeates, Carlos A.
Zollinger, Nathan Orsen

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Abbott, Max G.
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Anderson, Joseph Wesley
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Barber, Elizabeth
Barker, Betty Wight
Barlow, Emma Lou
Beckstead, Lloyd N., Jr.
Bennion, Leora Embry
Bell, Charlotte Lucile
Bell, Verna Dee
Bigler, Bonnie Rae Gardner
Binnie, Jean
Bishop, Cleo Don
Bowen, Jack Dixon
Boyack, Virginia Moody
Brenchley, Len S.
Briggs, Faye
Budge, Phyllis Jane
Checketts, Wendell T.
Clay, Mildred West
Claypool, Ann Mae
Clyde, Betty Jane Harris
Cochran, John R.
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Cowley, Betty Baker
Coyle, Francis Patrick
Cross, Dorothy S.
Daines, Mary J.
Darrington, Mary Jane
Day, Oreta Petersen
Demaras, Ronald Anderson
Dunn, Leslie S., Jr.
Elliott, John Greer
Emmett, Gladys
Erickson, Phyllis
Fabricius, Orpah Rigby
Fietkau, Janet Barker
Flory, William Edward
Frischknecht, Audrey
Fuhrman, Rozella Law
Galley, Ramona H.
Gardiner, Dawn
Groesbeck, Byron S.
Groves, Kenneth James
Gruwel, Milo Thomas
Hall, Ada Jensen
Handy, Mary Jane
Hansen, B. Arlene
Hansen, Colynn Ruth
Hansen, Lee O.
Hansen, Raynold B.
Harris, Erma
Harris, George D.

Harris, Wanda Murphy
Hawkes, Ella Lou
Heywood, Frank L.
Hill, Ira J.
Hobson, Agnes Hanson
Homer, Robert L.
Hughes, Olive S.
Husni, May Abdullah
Jenkins, Clarke C.
Johnsen, Verda
Jones, Eunice Thorpe
Jones, Merlyn Conway
Jones, Mildred
Jorgensen, Ephraim Lee
Jost, Margaret M.
Judd, Arthur C.
Judd, Chloe Julia
Kaul, Carol Jean
Keller, LaConna Mae Foster
Kelson, Lawrence
Kendall, Vanda E. Smith
Kotter, Thelma Tingey
Larson, Leland K.
Larsen, Melba Martin
Larsen, Orba Jorgensen
Larsen, Reed M.
Larsen, Udean
Lawrence, Ilene
Lawson, S. Thomas
Lewis, Charles Howard
Linford, Jane White
Little, John Wilbur
Madsen, Carl D.
Major, Frank R.
Manning, Coy Christensen
Manning, John Paul
Martin, Benton C.
Mathews, Howard R.
Maughan, Conway L.
McAlister, Bobby Howard
McBeth, LeOra Rees
McCarrey, Lenora Rasmussen
McCowin, Janet Daines
McGregor, Larene F.
McKinnon, Margaret Baker
McNulty, John P.
Merrell, Arlene
Miles, Calvin E.
Miles, Lorin C., Jr.
Miller, Morris M.
Minchey, Orvil R.
Moody, Carl Antone
Mower, Mildred Allred
Neddo, Ann M.
Nelson, George Richard
Nelson, Richard Dean
Nelson, Stanley Christian

Nelson, Wayne W.
Nichols, Irma Christiansen
Olson, Leonora Merrill
Olson, Roy J.
Olson, Ruth Doty
Owens, W. Hugh
Packer, Boyd Kenneth
Panter, Ferris D.
Peterson, Lars K.
Peterson, Mary Price
Poppleton, Alice Chambers
Prestwich, Beth
Rasmussen, Kendall Ernest
Rasmussen, Howard Dale
Richards, Fern Butler
Richards, Veda C.
Rigby, Hazel B.
Romer, Anna Leola
Romer, Annie M.
Rose, Rulon R.
Russo, Jeanne M.
Ryan, William Russell
Saxton, Mary Louise R.
Shields, Ellis Reed
Skanchy, Elma Avondet
Skolmoski, Thaddius N.
Smith, L. Jay
Smith, Norman B.
Sorenson, Hoyle L.
Sorenson, John V.
Sorenson, Lois Fryer
Sorensen, Paul B.
Sorensen, Ruth M.
Spillet, J. Oren
Stoddard, Irwin T.
Swenson, Clair C.
Talbot, Walter DeVaur
Thornock, Ellen
Tillotson, Marion
Tippett, Nell J.
Tweedie, Charlene
Valgardson, Eethel Christine
Van Drimmelon, Robert
Wareing, LaVere Hansen
Watkins, Derrald Lewis
Weatherston, Rose Morrison
Welch, Robert S.
Welch, Shirley Chandler
Welti, June Marie
Wilde, Arnold L.
Williams, Keith L.
Williams, Walter T.
Wiser, Eliza K.
Woodland, Delores Hopkins
Workman, Dallas Ray

SCHOOL OF ENGINEERING AND TECHNOLOGY

Bachelor of Science in Agricultural Engineering

Beers, Newell Mason

Bachelor of Science in Civil Engineering

Burns, James B.
Carter, Jack Riley
Christensen, Boyd Leon
Crandall, Richard Roylance
Daines, Nolan H.
Daley, Max Lewis
Ellis, Dean Ray
Evans, Winslow W.
Fisher, Elden E.
Gardiner, Golden F.

Gardner, Rulon B.
Gilden, Charles J.
Hawkes, Leon R.
Iverson, Melvin DeLoy
Johnson, Blaine Eric
Jones, Norman B.
Linderman, Robert Bruce
Madsen, Welby R.
Madsen, Wilson A.
Moosman, Glen Ray

Myers, Lloyd Eldridge, Jr.
Nassir, Yousif
Pathak, Keshab Chandra
Pendleton, Alvin Freeman, Jr.
Rallison, Robert Eugene
Scott, David Kendall
Scott, Walter R.
Sevy, Laine Earl
Stowe, John Kaliff
Wall, Edward Matias

Bachelor of Science in Industrial Education

Butler, Robert John
Chandler, Jesse Z.
Cheever, George A., Jr.
Child, Rawson D.
Cox, Alvord L.
Cox, Morlin E.
Daniels, F. Russell
Draper, Reed Heber
Ellertson, E. Kent
Eskelson, Ross W.

Finch, Vernon Jay
Hansen, Charles Merlin
Jensen, Gilbert
McArthur, Ross J.
McCormac, James
McKinnon, Max E.
McOmber, David Ivans
Mickelsen, Gordon E.
Moulton, Boyd L.
Mower, Leo LaDean

Nichols, Ray L.
Pryor, Fred Roberts
Reid, Terrance Ronald
Rowland, Fred K.
Russon, Arland L.
Stell, William H.
VanAusdal, George Duane
Wallis, Carl R.
Washburn, Dewain Calvin
Whitaker, Max Junior

Bachelor of Science in Industrial Technology

Aldrich, Robert B.
Barker, Gerald L.
Bartholomew, Wesley Evan
Christensen, Lynn J.
Croft, Carl Roberts
Forsberg, Sylvan
Johansen, Neldon Ross
Kearl, James Russell
Laser, Theodore John
McCowin, Tius Walter
McGregor, Wells P.

Nielsen, Glade B.
Nielsen, Richard Edward
Olsen, Daniel Ward
Orme, Joseph Dale
Oviatt, Joseph LaDal
Palmer, Eldon Grant
Pendleton, William Richard
Peterson, Earl Don
Quilter, Glen Atherley
Rice, Clifford F.
Sharp, Paul Howard

Skeen, Ellison Riley
Steel, Darius H.
Taylor, Rex
Terry, Morris B.
Theobald, Evan "J"
Warby, Paul W.
Waight, John Ross
Wilson, James Vance
Wood, Edwin Lee

Bachelor of Science in Radio and Electronics

Adams, Clemon Bauer
Allred, Hush Bruce
Bert, Joseph Enos
Brown, K. Bernard
Campbell, Don Arden
Chapman, Howard Robert
Cole, Howard Hugh
Finchum, Willis Arnold, Jr.
Fowler, Bruce Varian
Grimm, Leonard

Heyborne, Robert Linferd
Holman, Frank S.
Hone, Shirli J.
Humpherys, Boyd V.
Jacobs, Sidney M.
Jarman, Charles Vernon
Jensen, Darrell H.
Jenson, George Easton
Johnson, Robert Ross
Kearl, Junior Alten

Kelsey, Daniel B.
Kowallis, Otto K.
Little, Frank A.
Loosie, John William
Sabin, Wallace Dewey, Jr.
Smith, Don Alden
Stephens, Frank Delmar
Wight, Jay A.
Yates, Glen A.

SCHOOL OF FOREST, RANGE, AND WILDLIFE MANAGEMENT**Bachelor of Science in Forest Management**

Braithwaite, Eugene Glen
Colton, Garth M.
Dandliker, Fredus B.
Farver, Albert B.
Frisby, Wendell E.
Fredrickson, Leo Ersell
Fluckiger, Darrol T.
Fry, George B.

Graham, Robert G.
Hendricks, Darwin C.
Jeske, Clifford E.
Madden, Thomas M.
Malencik, William J.
McCarty, Harry James
Millar, Richard Rockwell
Pearson, Marvin W.

Prato, Jose Luis M.
Price, William C.
Sandretto, Raynold P.
Schmitt, Daniel M.
Urbom, Raymond Carl
Whipple, Edsar L.
Wightman, Max Derrell

Bachelor of Science in Range Management

Bethers, Barton L.
Frandsen, O'dell A.
Hansen, J. Kimball
Hansen, Richard O.
Houston, Walter Randolph
Jensen, Joseph Edward

Leishman, Lynn Garrett
LeSueur, Harold B.
Martin, Robert D.
Meik, Eldon Earl
Morgan, Rex J.
Norris, Keith Elza

Reese, Bruce Watkin
Rogers, Grant Potter
Udy, Lowell J.
Wilcock, John Milton
Wilkes, Kay W.

Bachelor of Science in Wildlife Management

Andriano, Donald
Beck, DeWayne Joseph
Brassington, Thomas E.
Crawford, Clay E.
Earl, J. Curtis

Griffin, William H.
Harris, Bruce K.
Hart, Chester M.
Kirsch, Leo M.
Manke, Alfred O.

Morton, Donn Oliver
Nelson, R. Lynn
Pechacek, Louis S.
Peterle, Tony John

BACHELOR OF SCIENCE IN HOME ECONOMICS

Adams, Faye Fredricksen
Adams, Gloria Dawn
Adamson, Barbara Jean
Alldredge, Carma Rae
Ashdown, Jerald
Bailey, Marceline
Barber, Joan
Broadbent, Karna Lorraine
Budge, B. Jean
Burgoyne, Charlotte Tillotson
Cameron, Leila O.
Champlin, Helen Marie Hunt
Coulson, Lois Clareen
Cox, Ila Kingsford
Craven, Frances
Croft, Jane Urie
Curtis, Janis Rae Falck
Daines, Josephine
Dalley, Mary Isabell
Dance, Arlene

Felix, Helen Marie
Flamm, Peggy Marble
Gardner, Dorothy
Greaves, Mary Lois
Greenwell, Elaine
Hillman, Merle
Hillyard, Eunice Ruby
Johnson, Laura Lue
Keller, Joyce
Kelley, Ruth Holmes
Khouri, Muna Habib
Krueger, Marie Nelson
Lagos, Elaine
May, LaFawn Humpherys
McCowin, Bernice Hyer
Millard, Mozelle
Moore, Eva Lanice
Morrill, Ruby Alene
Mowton, Helen V.
Nielsen, Donna Ruth

Nielsen, Doreen
Nielsen, Gladys Ann
Nyman, Lorna
Pehrson, June
Platts, Jannetta I.
Sanford, Dorothy
Sedwick, Lois
Smith, Deanne
Smith, Marian
Smith, Muriel Sorensen
Spicer, Kathleen
Springer, Cara Jean
Sullivan, Shirley Olsen
Tankersley, Sammy Jean
Tanner, June
Tasso, Norma
Whitton, Annie Merrill B.
Zirker, Bonnie Mae

GRADUATE CERTIFICATE IN SOCIAL WORK

Brite, Luna Robertson
DeWitt, Donald F.

Jensen, Gordon Irving

Kunz, Thelma

MASTER OF SCIENCE DEGREE

MAHMOOD ALI, Dairy Husbandry — "Correlating Results of Mastitis Tests."

NORMAN H. ANDERSON, Educational Administration — Degree Obtained Under "B" Plan.

WILLIAM TRELEAVEN ANDREW, Vegetable Crops — "The Use of Plant Growth Regulators to Stimulate Head-set Growth of Sweet Spanish Onions."

WADE H. ANDREWS, Sociology — "Participation and Leadership of the People of Plain City, Utah."

DELOS BOYD ARCHIBALD, Agronomy — "The Effect of Time, Quantity, and Kind of Irrigation on the Yield of Sugar Beets."

CHESTER J. ATKINSON, Speech Correction — "A Study of the Response of a Group of Stutterers to a Remedial Program."

ROYAL ANDERSON BAGLEY, Bacteriology — "A Cultural and Transmission Study of Staphylococci in Turkeys."

BRUCE LLOYD BAIRD, Soil Science — "The Comparative Value of Commercial Phosphoric Acid as a Fertilizer."

RUSSELL B. BATESON, Psychology — "A Study of the 1947 American Council on Education Psychological Examination and its Usefulness in Predicting the Grades of Utah State Agricultural College Freshmen."

EVAN A. BAUGH, Physical Education — "A Study of the Effects of the USAC Coaching School on the Coaching Programs of those who Participate."

CLIFTON DAVIS BOXX, Educational Administration — Degree Obtained Under "B" Plan.

FRANKLIN K. BROUGH, Bacteriology — "The Fermentation of Ground Sugar Beets for the Production of Industrial Alcohol."

LEE WALLACE CARTER, Civil Engineering — "Seepage Losses from Irrigation Canals."

SUKHENDUBIKAS CHAUDHRI, Soil Science — "The Potash Status of Utah Soils."

J. Y. CHRISTIANSEN, Agricultural Engineering — "Consumptive Use of Water Studies in the Colorado River Area of Utah."

MARTEL S. COOPER, Poultry — "The Tolerance of Turkey Poults for Alfalfa Meals in their Diet."

CLIFFORD H. DARRINGTON, Educational Administration — "An Appraisal of the Functions and Practices of School Board Clerks in the State of Idaho."

LESTER NORMAN DOWNING, Educational Administration — "Factors Constituting an Acceptable Guidance Program for a Secondary School."

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- BERTIS LLOYD EMBRY, Engineering Physics — "Electric Fence Controllers Using Electronic Interrupter Circuits."
- STERLING KEITH ERCANBRACK, Animal Husbandry — "Reproduction in Young Ewes Wintered as Weanling Lambs Under Farm and Desert Range Conditions."
- SUHA S. FERN, Civil Engineering — "A Study of the Relationship of Certain Environmental Factors and Physical Characteristics of Soils to the Interpretation of Triaxial Shear Tests."
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- WYNN GEORGE FREEMAN, Wildlife Management — "An Analysis of Sex and Age Ratios and Sampling techniques of the 1946 and 1947 Hunters' Bag of Waterfowl in the Great Salt Lake Valley, Utah."
- WALTER OLBRICH FRIEDEMANN, Animal Production — "Comparison of the Fineness of Wool Produced by Yearling Ewes Sired by Rambouillet and Columbia Rams."
- NEIL C. FRISCHKNECHT, Range Management — "Seedling Emergence and Survival of Fifteen Range Grasses with Respect to Climate in Central Utah."
- JUNE H. GARDINER, Sociology — "A Comparison of the Results of the Harrower Multiple-choice Rorschach Test and a Marriage Prediction Scale."
- VAUGHN WILLIAM GORDON, Physical Education — "A Study of the Marketing Factors Used to Determine Pupil Marks by the Male Physical Education Directors in the High Schools of Utah."
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- JAMES ROBERT GRAY, Agricultural Economics — "Some Factors Associated with the Economic Feasibility of Reseeding Privately-owned Cattle Ranges in Utah."
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- KENNETH J. GROVES, Psychology — "A Comparison of Personality Patterns of Happily and Unhappily Married Couples as Measured by the Minnesota Multiphasic Personality Inventory."
- MERRILL HAWKES GUNNELL, Zoology — "A Curriculum Study of the Biological Sciences in the High Schools and Colleges of Utah."
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- LEWIS HARDING, Secondary Education — "The Professional Preparation and Teaching Assignments of Industrial Arts Teachers in Utah 1948-49."
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- TERRANCE E. HATCH, Educational Administration — "A Study of Some Personal Problems of North Cache High School Students."
- GLENN ROGERS HAWKES, Psychology — "A Study of the Minnesota Multiphasic Personality Inventory as an Index of Maladjustment in Certain Areas of College Life."
- B. AUSTIN HAWS, Zoology — "Varying Lygs Intensities and Stages of Plant Growth as Related to Alfalfa-seed Development."
- EARL HOLMSTEAD, Physical Education — "A Survey of the Teaching Combinations of Physical Education Teachers in the Secondary Schools of Utah."
- DONALD N. HYDER, Range Management — "Emergence and Survival of Four Introduced Wheat Grasses as Related to Intensity and Season of Planting."
- ARTHUR D. JACKSON, Educational Administration — "Supply and Demand of Elementary School Teachers in the State of Utah."
- SHIRLEY NELSON JENSON, Physical Education — "The Organization and Administration of Women's Intramural Programs in Selected Land-grant Colleges."
- WILLIAM L. JONES, Physics — "Optimum Spacing for Maximum Gain in Three-element Parasitic Antenna Arrays."

LIST OF GRADUATES

285

- MAURICE R. LAMBERT, Agricultural Education — "The Selection and Use of Agricultural Advisory Councils in Utah."
- CHEENG-HSIN LI, Chemistry — "The Essential Amino Acid Content of Selected Chicken Tissues."
- FRANK R. MAJOR, Secondary Education — "An Analysis of Recommendations of Selected Groups Concerning the Objectives and Content for Biological Sciences of the Secondary Schools."
- MERLIN J. MECHAM, Speech Correction — "The Type and Extent of Hearing Loss of Speech Defective Children in the First Six Grades of the Elementary Schools of Cache County and the Logan City School Districts."
- EZRA HUDSON MOORE, Educational Administration — "The Status of Idaho Teachers in Reference to the New Certification Standards."
- ROLLO J. MORRIS, Physical Education — "An Evaluation of Swimming Abilities of the Male Freshmen of the Utah State Agricultural College."
- JAY NEWTON MYERS, Animal Husbandry — "Comparison of Wool Production by Yearling Ewes Sired by Columbia and Rambouillet Rams from Farm and Range Condition."
- MOUNIR R. NAGMOUSH, Dairy Industry — "Study of Hydrogen Peroxide in Treating Milk for Cheddar Cheese Making."
- NIRMAL KUMAR NANDI, Civil Engineering — "The Hydraulic Design of a Side Channel Spillway."
- ALMA ERROL NIELSON, Wildlife Management — "Some Factors Affecting Population Changes."
- REX F. NIELSON, Agronomy — "The Effect of Various Fertility and Moisture Levels on the Yield of Sweet Corn."
- JOHN KEITH NOYES, Agronomy — "Seed and Forage Production in Four Clonal Lines of Alfalfa as Influenced by *Lygus* Infestation."
- JAMIES J. O'TOOLE, Physiology — "Alfalfa as a Source of Carotene in the Diet of Chicks."
- GREGORY L. PEARSON, Civil Engineering — "Drainage in the Lewiston Area, Utah."
- LeGRANDE A. PENDREY, Psychology — "The Relation of Kuder Preference Record Profiles to Choice of and Achievement in College Curriculum."
- HAROLD BURKE PETERSON, Civil Engineering — "A Study of the Effects of Salinity on Various Highway Subgrade Soil Constants."
- LYNN O. PITCHER, Physical Education — "An Evaluated Adagio Program in the Physical Education Curriculum."
- BORIS H. POPOV, Zoology — "The Introduced Fishes, Game Birds, and Furbearing Mammals of Utah."
- WAYNE R. RICH, Secondary Education — Prediction of Student Achievement in College Mathematics."
- RALPH ROLLINS, Civil Engineering — "The Study Using the Electric Analogue of Influence Conditions of Discharge on Hydro-dynamic Flow Patterns in Earth Dams."
- SAYIED BAD SHAH, Agronomy — "Inheritance Studies in Black Stem Rust of Wheat (*Puccinia graminis tritici*)."
- LEE A. SHARP, Range Management — "The Diet and Daily Forage Consumption of an Experimental Herd of Sheep on Utah's Winter Range."
- KENJI SHIOZAWA, Landscape Architecture — (A) "Design Analysis of Suburban Community Planning." (B) "Design Analysis of Forest Recreation Development as Applied to a Summer Homes Unit Area."
- IRENE SMITH, Secondary Education — "A supervised Study Plan for the Eighth Grade of the O. E. Bell Jr. High at Idaho Falls."
- WESLEY D. SOULIER, Agricultural Education — "To What Extent are the Carl Raymond Gray Scholarships Functioning in the Terms of their Original Purposes."
- DAN H. SWENSON, Industrial Education — "A Guide to be Used in Evaluating Audio-Visual Aids for use in the Teaching of Industrial Arts in the Junior High Schools of Utah."
- GEORGE WILLIAM SPERRY, Secondary Education — "Supply and Demand of Secondary School Teachers in Utah."
- J. WIENDELL STUCKI, Agricultural Economics — "A Farm Management Study of Twenty-two Madison County Farms."
- EARL JOHN TAYLOR, Entomology — "The Biology of *Nabis alternatus* Parshley (Hemiptera, Heteroptera). Its Predacious Relationship to some Alfalfa Pests in Cache."
- NELS A. THORESON, Wildlife Management — "An Evaluation of Trout Stocking the Logan River Drainage."
- JAMES LAWRENCE VANDERBEEK, Dairy Industry — "Streptococcus Faecalis in Commercial Cheddar Cheese Making."
- STANLEY HOWARD VAN ORMAN, Civil Engineering — "The Drainage Problem in the Draper Area, Utah."

- HORACE MARR WADDOUPS, Plant Breeder — "A Study of Semi-Sterility and its Linkage Relationships in Trans-locating Stocks of Barley."
- RICHARD I-HSIANG WANG, Chemistry — "Content of the B Complex Vitamins in Chicken Tissues."
- CAROL COX WATKINS, Foods and Nutrition — "The Effect of Varying the Levels of Calcium and Phosphorous Upon Carotene Utilization as Determined by Liver Storage in Rats."
- LeROY L. WEST, Psychology — "Administration of the Minnesota Multiphasic Personality Inventory Under Varied Conditions."
- QUENTIN MECHAM WEST, Agricultural Economics—"Productivity of Crop Land in Cache County, Utah."
- DARRELL S. WILLEY, Secondary Education — "A Comparative Analysis of Rousseauian Education and the Purposes of Education of the Educational Policies Commission."
- TING-CHANG YAO, Chemistry—"Surface Arsenic Occurrence on Some Plants Attractive to Bees."

SUMMARY OF ATTENDANCE

1949-50

RANK	AGRICULTURE		FORESRY	ARTS & SCIENCES		COMMERCE		EDUCATION		ENGINEERING		HOME ECONOMICS		TOTAL
	Men	Women		Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	
Graduates	64	1	16	44	10	14	6	42	19	41		9		266
Seniors	115	1	60	89	40	107	17	69	54	133		66		751
Juniors	212		122	159	56	180	22	153	94	256	1	60		1315
Sophomores	180	2	118	153	61	131	37	85	62	206		1	66	1102
Freshmen	288	2	109	304	149	127	84	93	69	278	2	1	99	1604
Total Collegiate	859	6	425	749	316	559	166	442	298	914	3	1	300	5038
Vocational	1			5	1			1	3	1		2		14
Totals	860	6	425	754	317	559	166	443	301	915	3	1	302	5052

Male 3957
 Female 1095
 Total 5052

SUMMARY OF ATTENDANCE

INDEX

	Page
Academic Regulations	43
Accounting	144
Administration	7
Admission	43
Advanced Standing	44
Aeronautics and Ground School	201, 203
Air Conditioning and Refrigeration	204
Agricultural Economics and Marketing	71, 141
Agricultural Education	73
Agricultural Engineering	191
Agricultural Experiment Station	272
Agricultural Experiment Station Staff	25, 26
Agriculture, Department of	67
Agriculture, General and Specialized	68, 69
Agriculture, School of	66
Agromony	75
Alumni Association	41
Animal Husbandry	80
Animal Industry Building	37
Art	164
Arts and Sciences, School of	101
Automotive	207
Awards and Scholarships	58
Bachelor of Science Degree, Requirements for	50
Bacteriology and Public Health	83, 104
Band, ROTC	261
Barns, College	38
Biochemistry	109
Biology	132
Board of Trustees	7
Botany and Plant Pathology	86, 105
Branch Agricultural College	30, 278
Building Construction	224
Buildings and Facilities	36
Business Administration	143, 145
Business and Distributive Education	147
Cafeteria	36
Campus Organizations	40
Class Standing	53
Chemistry	106
Child Development and Parent Education	249
Child Development Laboratory	38
Civil Engineering	194
Clothing	250
College Calendar	6
College Citizenship	64
College Libraries	39
Commerce, School of	139
Commons Building	36
Correspondence Study	274
Credit by Examination	46
Credits	45
Crops	78
Dairy Industry	88
Debating	40
Degrees:	
Bachelor of Science	50
Master of Science	53
Doctor of Philosophy	55
Diesel Mechanics	213
Dietetics	254
Division of Air ROTC	266
Dramatic Art	127

	Page
Economics	148
Education, Elementary	170
Education, School of	162
Education, Secondary	171
Educational Administration	169
Elementary Training School Staff	26
Emeritus Faculty	9
Engineering Building	37
Engineering, Civil	194
Engineering and Technology, School of	189
Engineering Division	191
Engineering Experiment Station	273
English	110
English Placement Examination	47
Entomology	134
Entrance Requirements (See Admission)	43
Evening School	276
Expenses	56
Extension Classes	274
Extension Service	274
Extension Service Building	37
Faculty	10
Faculty Committees	8
Federal Collaborators	28
Fees	57
Field House	36
Foods and Nutrition	253
Forest Management	230
Forest, Range, and Wildlife Management, School of	227
Forestry Building	37
Forging	219
Fraternities, Honorary and Social	40
French	122
General Information	34
Geology	115
Geology and Geography	115
German	123
Graduate Division of Social Work	159
Graduate School	52
Graduate Work in Education	174
Graduation	49
Greenhouses	38
Group Requirements	47
Ground School	203
Guidance Program	63
Gymnasium	36
Health Service	64
Herbarium	39
High School Certificate Requirements for	51
History	117
History of the College	34
Home Economics Education	255
Home Economics, School of	241
Home Study	274
Horticulture	91
Household Administration	255
Hygiene	83, 104
Incomplete Work	46
Industrial Arts Education	211
Industrial Education Program	210
Institutional Management	253
Intramural Sport	178
Introduction	33
Irrigation (See Agricultural Engineering)	198

	Page
Journalism	114
Kerr Hall	38
Laboratories	38
Landscape Architecture and Planning	95, 118
Late Registration	45
Latin	124
Library	35
Library Building	37
Library Science	174
Loan Funds	62
Location of the College	34
Low Scholarship and Probation	46
Lower Division	47
Lund Hall	38
Main Building	36
Major Subject	48
Marketing	73, 141
Master's Degree	53
Mathematics	118
Mechanical Drawing	217
Mechanic Arts Building	37
Merchandising	148
Metalwork and Mechanical Drawing	216
Military Science Building	37
Military Science and Tactics	120, 257
Military Science Regulations	259
Minor Subjects	49
Modern Languages and Latin	122
Music	175
Non-Resident Fee	56
Normal Registration	45
Numbering of Courses	46
Nursing	136
Nursing Education	30
Nutrition	253
Officers of Administration	7
Opera	40
Photography	168, 215
Physical Education and Recreation	177
Physical Plant	36
Physics	124
Physiology	136
Plant Industry Building	37
Plant Pathology	86, 105
Policy of the College	34
Political Science	151
Portuguese	124
Poultry Husbandry	96
Poultry Plant	38
Practice House, Home Economics	38
Pre-Dental Training	103
Pre-Legal Training	140
Pre-Medical Training	102
Pre-Nursing Training	104
Pre-Veterinary Course of Study	99
Private Instruction Courses	177
Probation	46
Provisions for Education of Veterans	44
Psychological Clinic	63
Psychology	184
Public Health	85
Radio	222
Radio and Electronics	222
Range Management	234

	Page
Recreation	178
Registration and Credits	45
Registration Dates	45
Religion	64
Research and Extension	271
Reserve Officers Training Corps	259
ROTC Advanced Courses	260
ROTC Band	261
ROTC Elementary Courses	260
Rural Economy	72
Scholarships, Fellowship, Awards	58
School of Agriculture	66
School of Arts and Science	101
School of Commerce	139
School of Education	162
School of Engineering and Technology	189
School of Forest, Range, and Wildlife Management	227
School of Home Economics	241
Secondary Education	171
Secretarial Science	153
Smart Gymnasium	36
Social Work, Division of	159
Sociology	156
Soils	78
Sororities, Honorary and Social	40
Spanish	123
Special Awards	58
Special Fees	57
Speech	127
Speech Clinic	65
Stenography	153
Student Body Organization—Associated Students	40
Student Health Service	64
Student Organizations	40
Student Publications	40
Summary of Attendance	287
Summer Camp (Forestry)	229
Summer Quarter	276
Surveying	196
Teacher Placement Bureau	163
Teachers' Certificates	163
Teaching Assistantships	56
Technology Building	37
Terminal Certificate	49
Thesis	54
Textiles and Clothing	250
Theatricals	40
Trade and Industrial Education	212
Training for Government Service	140
Transfer Students	44
Typewriting	154
Upper Division	48
Vegetable Crops	97
Veterans, Provisions for Education of	44
Veterinary Science	99
Veterinary Science Building	38
Visual Aids	274
Vocational Education	173
Welding	220
Widdow Hall	37
Wildlife Management	237
Withdrawal from Classes	45
Women's Residence Hall	38
Woodwork and Building Construction	224
Zoology and Entomology	100, 131